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All communications to be addressed:
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JOHN COWAN,
Minister of Agriculture.

POINTS FOR PRODUCERS.

Pasture Plants at Mount Remarkable.

At the suggestion of the Department of Agriculture, one of the soldier settlers on the Mount Remarkable estate, Mr. Roy Treglown, tried on his hills block, a number of different pasture plants. Recently Mr. Treglown forwarded some specimens of these plants to the Department of Agriculture for the purpose of showing the growth made by Wimmera rye-grass, Subterranean clover and lucerne. The rye-grass was over 1ft. in height, which, for the first season's growth, was very satisfactory. The Subterranean clover had made plants 5ft. in diameter and another satisfactory feature was that it had seeded extremely well. Amongst the plants forwarded were specimens of cluster and hop clovers, which had made very strong growth on land that had been dressed with superphosphate.

The Agricultural Bureau.

During the year 1923, twelve country Conferences have been held under the auspices of the Agricultural Bureau of South Australia. An outstanding feature at these gatherings has been the remarkably good attendance of farmers, the most noteworthy instance being the Conference of Central Eyre's Peninsula Branches which was held at the Government Experimental Farm, Minnipa, in September, and which was attended by some 300 or 400 representatives from practically all parts of Eyre Peninsula. The usual plan on which these Conferences is arranged is for papers to be read by representatives of the Branches interested. These form the basis of discussions in which delegates and officers of the Department take part. An undoubted advantage associated with this is the fact that it enables the experts of the Agricultural Department to acquaint themselves with the precise nature of the problems that are confronting the farmers, and thus to supply just that information which should prove of most value. In addition, at these gatherings questions, previously submitted or impromptu, are replied to by the experts. The tenor of the discussions which have taken place at the Conferences held this year suggests that farmers generally are realising in increasing numbers the advantages associated with Conferences of this nature.

"Take-all."

Arrangements have been made by the Department of Agriculture for an exhaustive investigation of the "Take-all" problem in South Australia. The services of the lecturer in Plant Pathology of the Adelaide University (Mr. Geoffrey Samuel) have been requisitioned for the purpose, and this officer will devote practically the whole of his energies to the matter for some time. In pursuance of his inquiries, Mr. Samuel recently visited the Pinnaroo district. Through the courtesy of the local Branch of the Agricultural Bureau, who provided

him with transport facilities. Mr. Samuel was enabled to visit a large number of farms, inspect crops, collect samples, and investigate the disease generally in the field.

Value of Production.

The actual average net prices secured for sound and reject apples sold from the orchard after deducting all costs of cases, packing, and storage, except the labor of picking and grading, are as follows:—

Season.	Per case.
	s. d.
1918-19	5 6.27
1919-20	4 11.79
1920-21	5 7.47
1921-22	4 10.42
1922-23	4 7.77

Average for five years 5 1

On the basis of these figures, the average annual value per acre of 125 trees has been calculated for the different varieties as follows:—Cleopatra £36 10s. 2d.; Rokewood £23 6s. 8d.; Jonathan £21 5s.; Dunn's Seedling £20 15s. 1d.; Gravenstein £20 5s. 2d.; Rome Beauty £17 15s. 2d.; Scarlet Nonpareil £17 6s. 10; Ribston Pippin £16 5s.; King of Tompkins County £14 11s. 8d.

Fruit Growing at Kybybolite.

Mainly with a view to testing the possibilities of commercial apple growing in the district, an area of land at the Kybybolite Experimental Farm was planted to fruit trees in 1908. About 10 acres were put under apples and about one acre under mixed stone and pip fruits and vines. The great majority of the trees planted consisted of export apples of the three well-known kinds—Cleopatra, Jonathan, and Dunn's Seedling, and a few rows of Rokewood, Gravenstein, Ribston Pippin, King of the Tompkins County, Scarlet Nonpareil, and Rome Beauty were included. All the trees were planted 20ft. apart on the septuple system, and the rows of varieties were alternated, so that no two rows of any one variety are adjacent to each other. The Orchard has been surrounded by breakwinds of almonds on the north-west side, *Pinus insignis* on the south-west, and *Cupressus sempervirens* (Cypress) on the north-east, and of these, the *Pinus insignis* has made the most effectual breakwind. In the first report on apple growing at Kybybolite Experimental Farm, the Manager (Mr. L. J. Cook) states that during the past five years, the average annual yield of the different varieties of apples has been as follows:—Cleopatra 63.4lbs.; Gravenstein 42.2lbs.; Dunn's Seedling 40lbs.; Jonathan 35.4lbs.; Rokewood 31.3lbs.; Ribston Pippin 27.3lbs.; Rome Beauty 26.6lbs.; King of Tompkins County 25lbs.; Scarlet Nonpareil 24.9lbs. The Cleopatra variety stands out as the most prolific bearer, being the heaviest yielder in three out of five seasons under consideration, and

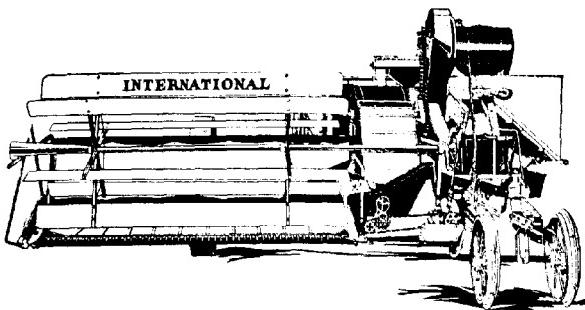
Gravenstein holds the pride of position in the other two seasons. The fact that the yearly average of Cleopatra has been half a cuse above any other variety, and also that over one-third of the orchard consists of this variety, has kept the average per tree of the whole orchard as high as 45lbs. per tree, which is above the average production of any other variety.

Manuring.

Tests designed to determine the effect of manuring apple trees have been carried on since 1914 with three varieties of apples, namely, Jonathan, Cleopatra, and Dunn's Seedling. Lime, superphosphate, potassium sulphate, and ammonium sulphate have been tried individually and in combination, and also farmyard manure and green manuring. In every case the returns secured show an increase over and above the cost of manuring. The value of the increase in the case of trees treated with 3lbs. superphosphate and 10lbs. lime was highest, namely, £13 12s. per acre; 3lbs. super. and 1½lbs. potassium sulphate per tree returned increase valued at £13 0s. 3d.; 3lbs. super. and 1lb. ammu. sul. £12 18s. 11d.; 3lbs. super., 1lb. ammu. sul., and 1½lbs. pot. sul. £11 3s. 1d.; 1ewt. farmyard manure £8 13s.; 10lbs. lime £8 6s. 11d.; 3lbs. super., 1lb. ammu. sul., 1½lbs. pot. sul., and 10lbs. lime £8 7s. 4d.; 1lb. super., ½lb. ammu. sul. £6 17s. 2d.; 1lb. super. £6 2s. 1d.; 3lbs. super. £5 13s. 4d.; 1½lbs. pot. sul., and 1lb. ammu. sul. £5 0s. 5d.; 1lb. super., ½lb. pot. sul., £4 13s. 9d.; green manure every two years £4 9s. 9d.; green manure and 10lbs. lime every two years £4 5s. 11d.; 1lb. super., ½lb. pot. sul., and ½lb. ammu. sul. £2 10s. 2d.; ½lb. pot. sul. and ½lb. ammu. sul. £1 14s. 7d., 1ewt. farmyard manure and 10lbs. lime £1 3s. 7d.

Sandy Soils in Wet Weather.

It is a matter of common experience that crops on sandy soil are poor in years of wet winters and frequently good in years of low rainfall. The usual explanation of these facts, the Director of Agriculture (Professor Arthur J. Perkins) recently informed a correspondent is as follows:—Sandy soils are exceptionally permeable and therefore exposed to being leached of their soluble fertilising matter by heavy winter rains and the result is that in early spring their crops are unable to make the progress attained by those on heavier soils. Similarly in dry years, sandy soils have the advantage from the fact that it takes far less water to saturate a sandy soil than to saturate one of heavier texture: for example, a fall of 10 to 20 points of rain might prove quite effective from the point of view of growth of plants on sandy soil, and be absolutely without results from the point of view of plants growing on a heavy soil. The main point is this, that the amount of moisture in soils available to plants is not determined absolutely by the amount of rain falling thereon, but rather by the excess of moisture in the soil over and above the quantity held firmly by the soil and beyond the immediate reach of the roots. In other words, again sand



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which is not retentive of moisture, holds at the disposal of plants practically the whole of the moisture that reaches it; whilst heavy soils, on the other hand, that are retentive of moisture, only give up moisture to soils grudgingly and require, therefore, far heavier quantities of rain to produce good crops.

Director of Agriculture at Virginia.

Recently the Director of Agriculture (Professor A. J. Perkins) visited Virginia, and in company with Messrs. W. H. Land, R. Legoe, and J. A. Ryan, members of the local Branch of the Agricultural Bureau, inspected a number of farms in the District. On his return to Adelaide, Professor Perkins mentioned that this was essentially a hay growing district, and although the wet season had probably reduced the average yields of the fields, there were several fine crops to be seen, notably that of Messrs. Baker Bros., adjoining the railway station. "It is interesting to note," continued the Director, "that in this district the value of heavy dressings of phosphates is recognised, both from the point of view of heavy yields, and also from the viewpoint of the after effects on the grazing qualities of the land. One owner in the district, Mr. Baker, had dressed poor pasture land with super with very satisfactory results, and he expressed his intention of extending his operations in future years. Mr. Legoe has planted Virginia Park extensively with lucerne, and is carrying flocks which give every indication of being well fed and cared for." In the evening the Director addressed the members of the local Branch of the Agricultural Bureau on "Cereal Growing," dwelling chiefly on factors leading to maximum yields.

The Fruit Crop.

From officers stationed in various fruit districts, the Horticultural Instructor of the Department of Agriculture (Mr. Geo. Quinn) has received reports of the setting of the fruit crops. In general summary the text of these is to the effect that apples, although giving good promise in bloom, have only produced a setting which may be estimated as a fair average crop. Pears are generally reported to be setting well, particularly the Williams, or Bartlett variety. Peaches, however, are everywhere reported to have set very indifferently. Apricots promise to produce from one-quarter to one-third of the yield of last year, which in most localities was a record crop. The nature of the prospective plum yield is varying, some districts reporting a good setting of plums, but on the whole, the crop, particularly of the Japanese varieties, will be much lower than the average. All kinds of grapes are flowering profusely, the number of bunches being above the average, although generally speaking, the bunches appear to be smaller in size than usual with most varieties. Oranges have made a heavy setting, but of course, this is likely to be modified very considerably by the shedding of the small fruits. The various berry fruits give indications of good yields. Strawberries have set a large crop, but whether

the whole of the setting will be brought to maturity must depend almost wholly on the weather which prevails during the next few weeks. Up till the present it has been favorable. Cherries are only in moderate quantities, and the bird pest is making itself felt as soon as the faintest tinge of color begins to show on the early ripening varieties. A fairly heavy crop of loquats should be harvested and prices have been good. "One must infer from present conditions," continued Mr. Quinn, "that in-so-far as South Australia is concerned, prices for fruit marketed locally will tend to be fairly high, as it may always be assumed that when the first two or three kinds such as cherries, and apricots, are comparatively scarce, and prices consequently high, the kinds of fruit which follow in the order of ripening open at good market values."

The Effect of Weather on Fruit Trees.

The weather conditions prevailing during the past fortnight have resulted in a change for the better in the condition of most kinds of fruit trees. The rising temperatures resulted in healthier growth, but at the same time have revealed the fact that quite a number of fruit trees, particularly peaches, apricots, and almonds, have suffered severely through the excessive water in the soil during the long winter period. A fair number of the trees have started out into growth, but have died back and are shooting again from the more mature wood, and in the case of the orange trees they have in most plantations showed a decided tendency to become defoliated on the south-westerly side, a fact attributable to the extreme cold, squally weather, accompanied in many cases by hail storm. A continuation of the low temperatures into the spring months has been very conducive to the development of the fungus disease which causes curl leaf of the peach and nectarines, and many persons have expressed their doubts as to the effectiveness of spraying with copper and other compounds to prevent this disease. There is, however, abundant evidence available in many orchards in which the most susceptible varieties are grown, to indicate that a thorough and timely spraying according to the season, is a preventative of the disease. In respect to the trees that have died back, the suggestion is made by the Horticultural Instructor of the Department of Agriculture (Mr. Geo. Quinn) that no haste be displayed in cutting these back until there is evidence of an unmistakable character that the new growth starting lower down is making good; then the branches, limbs, or twigs, as the case may be, should be cut to where a start is being made. If large wounds are left, they should be covered over with lead paint and if the stems of the trees are much exposed to the sun and drying winds, it would be desirable to protect them with grass or bandages or whitewash until the new growth appears. It is very evident that these trees have lost portions of their root systems, and where a decline has not been too great, they will renew the root area, and in sympathy therewith, extend the top growth.

Yorke Peninsula Crops.

After having made a tour of practically the whole of the cereal growing portions of Yorke Peninsula during November, the Superintendent of Experimental Works (Mr. J. W. Spafford) remarked that the outstanding feature of the season in that area was the general excellence of the wheat and barley crops. Some of the crops were late, a fact due to the extreme wet in the early part of the season, but these crops were nevertheless, promising exceptional heavy returns.

Mount Gambier District.

On Friday November 30th last, the Mount Gambier Branch of the Agricultural Bureau made its annual tour of the district, in the course of which it visited a number of holdings and two butter and cheese factories in the neighborhood. Members of the Branch were accompanied by the Director of Agriculture (Professor Arthur J. Perkins), the Assistant Dairy Expert (Mr. H. J. Apps), the Field Officer for the South-East (Mr. E. S. Alcock), Orchard Instructor for the district (Mr. H. Orehard), and Representative Cameron, M.H.R. On his return to Adelaide, Professor Perkins mentioned that the district was looking exceptionally well and was carrying very good crops of barley and oats and even of wheat. There appeared to be more wheat sown in the district this year than usual, which was attributable to the unsatisfactory condition of the barley market during the last few years. In common with other parts of the South-East, landholders in this district were interesting themselves in Subterranean clover, which was extending naturally in some parts and was showing up well on what was previously fern land. Livestock in the district generally were looking well.

Combined Sprays.

As doubts are sometimes expressed by growers as to whether injury will result when lime sulphur and arsenate of lead are used as a combined spray, tests were conducted under the direction of the Horticultural Instructor (Mr. Geo. Quinn), during the month at the Government Experimental Orchard, Blackwood, to determine this point. The Manager (Mr. R. Fowler) reports that the results go to show that when carefully mixed, lime sulphur 1 in 70, with arsenate of lead added just before it is used, is a perfectly safe spray to apply, no injury resulting to the foliage or the fruit. Burgundy with arsenate of lead has also been reported as dangerous, owing to the liability of injury to the young fruits, but from tests made during the month, there appears to be no justification for supposing that this spray will cause the young fruits to fall off.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture, Adelaide.*"

Replies supplied by ALAN H. ROBINS, B.V.Sc., Government Veterinary Officer.]

"J. P. S.," Tarcowie, has two-year-old filly with wound constantly breaking out above the hoof.

Reply—I suspect the presence of a stake or nail in the hoof causing formation of pus, which, following the line of least resistance, breaks out on the top of the hoof. I advise a very careful search of the sole of the affected foot for the purpose of ascertaining if a nail, &c., is buried in it, and, with this object in view, I advise paring the sole lightly with a hoof knife, and if this does not throw light on the cause, apply wide-mouthed pincers to the sole all round by squeezing, and if there is any particular part which on pressure causes the animal to flinch, search it carefully for the small black spots, which very often indicate pus, and require to be searched with sharp-pointed knife in order to allow the pus to escape. The filly, if unbroken, will have to be thrown for examination.

"A. R. H.," Lochiel, asks cure for "pink eyes" in sheep.

Reply—Have the following lotion made up and put a few drops of it into the eyes affected, two or three times a day:—Zinc sulphate, 2 drams; boracic acid, 1 dram; distilled water, 1 pint. If possible keep the affected sheep in a shady position so that the eyes are not exposed to the full rays of the sun.

"W. T. LeG.," Coomandook, has draught mare with swollen jaws. The neck is always turned to the right side, and when driven the animal turns around.

Reply—Your mare is suffering from a condition known as torticollis, and the exact cause may be one of several possibilities. It seems to me from the history you supply of the case that it is due to a partial dislocation of the neck bones. You should try to reduce the dislocation by trying forcible extension of the neck. Pass a stout rolled sack around the neck just behind the ears, attach a piece of rope to it, and get several people to pull on it so as to stretch the neck and at the same time pull it straight. While this is being done, press on the convex side of the neck at the spot where it protrudes most prominently so as to try to push the dislocated bones back into position.

"V. J. S.," Clarendon, reports cattle with hair falling off, leaving a dry scab on the skin.

Reply—Your cattle appears to be affected with ringworm. I recommend you to scrub the affected spots with some soapy antiseptic solution to clean off the scales. Then paint the spots over with tincture of iodine. Repeat these applications daily until you see new hairs beginning to grow on the patches, which event should begin to be noticed after a few applications of this dressing.

"A. G. T.," Glencoe West, has cow with teat cut with barb wire. Milk has to be drawn with the aid of a tube.

Reply—The difficulty in drawing milk through the affected teat is due to cicatrical contraction of the cut after healing. Forced dilation may be practised by using a small conical-shaped instrument known as teat dilator. If this is

passed up the teat two or three times prior to milking and the operation repeated for several days prior to each milking, very satisfactory results are often obtained. The only care necessary is to see that this instrument is kept scrupulously clean.

Hon. Secretary, Agricultural Bureau, Penola, forwarded formation found in sheep that had died from unknown condition.

Reply—The plant specimen is that of the commonly called "Salvation Jane," considered usually to have a fodder value in its young stages, though after it reaches the flowering and seeding stage it becomes tough and indigestible. The other specimens are what are commonly called "stomach balls," and they usually exist in sheep's stomachs without their presence being suspected until death occurs. They frequently cause no disturbance at all, but large numbers would set up serious digestive disturbances with possibly fatal results. The nucleus of these balls were on examination found to be small pieces of undigested stalk of the "Salvation Jane," so that feeding the stock on it has had much to do with bad results. These balls are gathered by the sheep nibbling leaves, &c., of indigestible fodder ravenously, or they may also form through swallowing of wool from sheep biting themselves or other sheep. To reduce the possibility of sheep becoming affected with these stomach balls, they should be given a plentiful supply of salt lick. This will aid their digestion, and they are not so prone to eat indigestible fodder, which they do in a search for salt for their system.

Hon. Secretary, Rapid Bay Agricultural Bureau, sent several inquiries.

Reply—1. *Re* lancing abscess. If you are certain it is an abscess, with the use of caution it could be lanced. 2. *Re* dipping of sheep. It would be better not to dip while mating. 3. *Re* sows farrowing dead litters. There would quite probably be some error in the feeding and management of the pregnant sows. Pregnant sows should have plenty of exercise, be kept undisturbed and contented. Anything likely to create alarm or undue excitement must be avoided. Furthermore, they must be well fed on good nitrogenous food so that the development of the unborn litter may receive no check. 4. Sow going off food and losing milk after farrowing. This is probably due to constipation. Avoid all foods likely to produce this condition, the aim being to provide food that will produce milk. Give her a dose of castor oil administered in warm milk, and feed sparingly but regularly on skim milk, barley, pollard, scraps, and green feed. Allow the sow to have daily exercise. Keep her warm, comfortable, and contented. 5. To get early lambs. The breeding ewes should be in good heart, sturdy, but not too fat at time of mating. The period of pregnancy in ewes is five months, and you can with this information, calculate for yourself what time to join up the rams with the ewes according to what time you desire to have the lambs dropped. The usual time to commence the mating is during the last week or two of the year onwards, so that the lambs begin to be dropped from the beginning of June.

"G. H. W." Tarcowic, has pony which, after being driven a short distance, trembles violently and falls down.

Reply—The pony has evidently had two mild attacks of azoturia, which is usually associated with the causes of high feeding and irregular working. When not working it, you should restrict the diet and see that the animal gets plenty of daily exercise.

"W. B. P." Edithburgh, has cow which can easily be milked up to a certain point, then she can only be stripped by squeezing the udder.

Reply—The udder of your cow is affected with a chronic fibrosis, as the result of which it has, to some extent, lost its normal elasticity, so that it will not milk right out like a normal udder. No treatment is likely to be of any avail. This condition may be due to chronic mastitis, acrimycosis, or tuberculosis.

"A. E." Streaky Bay, reports blindness in a number of sheep.

Reply—The condition is a common ailment of sheep; contagious inflammation of the eye, from which there is a discharge and subsequently an opacity or cloudiness of the eye, which causes more or less temporary blindness. The same condition is sometimes caused by the presence of foreign bodies, such as grass seeds, dust, or any other irritating substances. The disease is a painful one, and the sheep will lose condition on this account and also because of their impaired vision and consequent inability to feed. Isolate those affected. Use the following lotion:—Sulphate of zinc, 16 grs.; tincture of opium, 3 drams; distilled water, 8ozs. Apply a few drops daily with an eyedropper.

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"A. J. C.," Lake View, Stanbury, asks whether the plant known as "mallow" is injurious to cattle.

Reply—It is definitely established that the feeding of the mallow to stock, horses, cattle, and sheep, and particularly young animals, will have injurious effects and produce definite symptoms of illness. Many feeding experiments have been conducted which successfully prove this fact.

"A. J.," Mindarie, has two-year-old cattle dog unable to hold food in the stomach.

Reply—Your dog is suffering from a chronic gastric catarrh, and it is possible that the primary cause of this may be tuberculosis. Regulate his diet, feeding twice daily on good wholesome food. Try the following medicine:—Glycerine, 1 oz.; pepsin, 2 teaspoonfuls; acid hydrochlor dil., 5 drops; tinct. gentian, 1 teaspoonful; water, a tablespoon. Give this immediately after feeding.

"Mrs. P. S.," Mount Barker, asks cure for scour in calves.

Reply—You must be thoroughly clean, use clean utensils, feed regularly, and not at irregular intervals, do not over-feed, and see that the feed is always given at blood temperature. A good ration is to feed warmed skim milk in which has been dissolved jelly made from whole lin-seed in the proportion of 1½ ozs. of linseed jelly to 1 gal. of skim milk. To prepare the jelly, steep the seed in hot water for four or five hours, then put it on the fire and boil for 30 to 30 minutes to burst the seed. One teaspoonful of dried blood meal added to each feed is a very excellent remedy for calves suffering from scouring, or if you cannot get this, you may try the following:—Brown a cupful of wheat flour, first mixing it with a little cold milk to prevent cooking, then stir it into hot milk and give to the calf rather warm. A teaspoonful of ground ginger might be added. Continue this feeding so long as there is any trouble, and after the scouring has stopped, give the flour without searching for two or three days longer.

"S. Bros.," Yalmania, report foal three weeks old with the walls of both front feet almost vertical.

Reply—Your foal is apparently suffering from knuckling. You should try to lower the heels as much as possible by careful paring away of the horn with a foot knife, in order to try and bring the front wall of the hoof and the pastern more into a normal sloping position. If you can do this and let the foal have plenty of exercise the condition should gradually reduce itself.

"C. L. P.," Spalding, has horse six years old, hair falling off all over the body, and the skin is a mass of sores.

Reply—Your horse appears to be suffering from eczema; his blood is apparently in very bad order. Give him a good dose of physic, either an aloes ball or oil. lini, 1 to 1½ pints. Then for some time after that give him a handful (2ozs.) Epsom salts in damped feed night and morning. Put 1oz. of Fowler's solution in his drinking water daily for 10 days. Clean the skin of the body thoroughly by washing it with some soap and warm water and a little antiseptic added. Then apply two or three times a week to the skin a little of the following:—Boracic acid, 1 teaspoonful; bicarb. of soda, 1 teaspoonful; laud. 6ozs.; rubbing it in well.

"K. S.," Brentwood, has horse with badly swollen hind leg extending from the pastern to the hock.

Reply—Your horse is suffering from an attack of lymphangitis. Feed him on bran mashes for a day and then give a good dose of physic:—Aloes, 5 drams; calomel, ½ dram; mix romica, 1 dram. Give him only bran mashes until the effect of the physic has worked off, and then keep him on light diet only; no corn. The swollen leg should be bandaged from the pastern up to the hock, putting it on fairly tightly and starting from the pastern and working up. Keep the bandage wet with cold water. After the soreness has disappeared give him regular exercise in order to make him use the leg.

Hon. Secretary, Agricultural Bureau, Woorullia, asks the cause of horses eating the bark off mallee trees.

Reply. The horses are suffering from pica or chronic indigestion, which is caused by some error in their general management and dieting, and is usually manifested by this depraved appetite. They should be supplied with rock salt and whiting to lick, and particular care must be taken with their feeding. It may be necessary to give them a change of food.

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"J. H.," Harrogate, reports cow givingropy milk from one teat.

Reply.—The cow has mammitis, affecting that one quarter, and you will have to be very careful and clean in handling her to prevent the other quarters from becoming affected. Foment the udder frequently and strip out the affected quarter every hour if possible, destroying the curdled milk. The milk from the other quarters should be fit for consumption, but it should be boiled before being used.

HIGH OR LOW GRADE SUPERS.

Agricultural Bureau, Shoal Bay.—The Director of Agriculture (Professor A. J. Perkins) states:—"There is every advantage in using the high-grade 45 per cent. superphosphate, particularly on limestone soils. There is economy in transport costs in the first place and economy in unit price in the second. Thus, as an illustration, suppose a farmer was accustomed to dress his crops with lewts. of 36 per cent. super per acre and seeded annually 400 acres, this would mean he would have to purchase and convey over the railways 20 tons of super per annum. If he made use of 45 per cent. super the quantity would be reduced to 16 tons per annum, allowing for a mean dressing of 89lbs. per acre, which would be equivalent to 1ewt. of 36 per cent. super. Similarly, 20 tons of 36 per cent. super at 86s. would represent £86 sterling; 16 tons of 45 per cent. super at 100s. would represent £80 sterling."

BINDWEED.

"G. J. S.," Georgetown.—The Superintendent of Experimental Work (Mr. W. J. Spafford) says:—"Bindweed, or convolvulus, when once established, is extremely difficult to eradicate, and the only way I have seen it controlled is by enclosing the affected area with a good sheep-proof fence and 'dry' feeding sheep in the fenced-off plot. If the block of land carrying this very bad weed is only small, surround it with a good fence, provide a water trough, and enclose a few wethers on it and feed them on cereal hay. You will need to keep sheep on the plot for at least 12 months, and possibly for 18 months, but providing that the block is not far from your homestead so that it is not too much trouble to feed and water the sheep regularly, you will not lose much on the transaction, particularly if meat and wool keep up in price. You will either keep some of your ration sheep on the plot or else fatten a number of small lots of wethers for sale, and for the purpose you will need to provide 2lbs. of hay per sheep per day throughout the year. If you leave the same sheep on the plot the whole time, and just take off their wool, it would be better to build a straw stack in the fenced-off area, and provide the sheep with a little grain each day (say, 1lb. to 1lb. per head) or about 1lb. of hay per sheep per day."

BUNT AND FLAG SMUT.

Yadnarie Agricultural Bureau.—The Director of Agriculture (Professor A. J. Perkins) replies:—"There is no necessary connection between 'bunt' in wheat and 'flag smut' (so-called black rust); indeed, there is a vital difference between the two from the point of view of infection. Infection in the case of 'bunt' comes almost exclusively through the seed, whereas in the case of 'flag smut' infection is almost invariably from the soil. It cannot, therefore, be said that conditions which favor the development of 'flag smut' necessarily favor the development of 'bunt.'"

SAND DRIFT.

"S. M.," Millicent, seeks information respecting a grass to stop sand drift.

The Superintendent of Experimental Work (Mr. W. J. Spafford) replies:—"Where sand drifts very badly, so that 'craters' or 'blow-outs' are formed or when a big mass of sand continues to move each time that it gets dry, the growing of Marram grass has been the most effective means yet used to control it, and this grass will do the work in any district receiving on the average at least 20in. of rain annually. The area to be planted with Marram grass should be handled somewhat as follows:—1. It must be fenced off so that livestock and rabbits do not gain access to it. 2. Rooted sections must be transplanted in rows about 6ft. apart, the plants being about 2ft. apart in the rows. 3. Each clump of grass planted should be of such a size that the stems when grasped by the hand should form a 'hand-full.' 4. When planting, the rooted plants must not be bent, but

should retain all of the growth as received from the supplier. 5. The direction of the rows should be as much as possible across the line of the most prevalent winds, so this direction has to be altered according to the lay of the land, and in some blocks the direction for the rows is continually changing, whilst in others the rows will be more or less semi-circular. 6. The depth of planting varies according to conditions; in sand drifting at the time of planting the plants will tend to be put in holes 15in. deep, but if the sand is not likely to move again for a few months about 9in. is deep enough for planting. 7. After the plant is put in the hole the sand should be firmly compacted around it by tramping or ramming. 8. Planted at the spacings mentioned will mean 3,630 'plants' per acre, and 1 ton of grass consists of about 2,800 'plants' of a size that a man can conveniently hold in his hand. 9. Plant Maran grass from May to August. 10. After the second year the grass can be grazed, but this grazing must be done carefully so as not to thin out the grass and again start the drift, and livestock should only be turned on the area when there is a lot of growth, and never when the grass is low. 11. The borough of Port Fairy, Victoria, will supply plants and give you much useful information.

"If the sand drift you wish to control is not a very bad one, the Buffalo grass used in lawns will hold the sand well and provide you with really good grazing, both as to quantity and quality. This grass should be planted during the period August to October as follows:—(a) Fence off the area to keep livestock and rabbits outside. (b) Put rooted sections of Buffalo grass 4in. to 6in. deep, about 18ft. apart each way. (c) Tightly compact the land around each plant. (d) If the land has been cultivated the 'plants' can be sown in plough furrows, being careful to roll the land after planting. (e) Once established this grass will provide much grazing, but livestock must not be left on it for long periods; rapid feeding, then removal of stock is the best way to handle a sand-holder. (f) A dressing of 1ewt. superphosphate per acre will increase the grazing capacity very considerably."

FOOT ROT.

"A. T. C." Arno Bay, forwarded specimens of diseased wheat plants which were examined by the Lecturer in Plant Pathology (Mr. Geoffrey Sammel), who states that the wheat forwarded was affected by the "foot rot" fungus, *Helminthosporium*. A description of the disease is to be found in the New South Wales Agricultural Gazette, XXXIII, 13-19, where the writer considers that it sometimes does more damage than take-all. Control methods at present known are the same as for the latter well-known disease (burn stubble, early fallow, clean fallow, good compact seed-bed, good dressing of super). The disease may be expected to be worse in wet seasons. Affecting scattered plants more, it is not so obvious as take-all, and more of it may be present in the State than is suspected.

SITKA SPRUCE.

Longwood Agricultural Bureau desire to know whether the American Sitka spruce would be a suitable timber to grow in cold and wet localities of the Adelaide hills.

The Conservator of Forests (Mr. Walter Gill) says that the Sitka spruce (*Picea sitchensis*) may do fairly well in the Adelaide hills where the rainfall is heaviest, and the land sufficiently drained; but it is not likely to attain the dimensions which it reaches in Alaska, where snow prevails for a considerable part of the year.

OIDIUM.

"C. H. N." Langhorne's Creek, sought information respecting the use of lime and sulphur as a means of controlling oidium. Some large berries on vines treated cracked.

The Horticultural Instructor (Mr. Geo. Quinn) says the use of a mixture of powdered lime and flowers of sulphur has been advocated for many years as a remedy against the powdery mildew (oidium) of the grape vine. The reason why the larger berries cracked would most probably be found in the fact that they, having thinner skins, would have received greater injury from the oidium prior to the dusting. The dusting of a mixture of air-slaked lime and sulphur would not cause the skins of healthy grapes to crack.

WHITE CLOVER.

"A. T. McE.," Jamestown, seeks information respecting white clover.

The Superintendent of Experimental Work (Mr. W. J. Spafford) says:—White clover is a plant which grows in wet situations, and if it is to be grown in dry soil with good drainage or on land which is dry in the summer, it must receive a good supply of irrigation water. The seed can be sown either in the autumn (March, April) or in the spring (September and October)."

CATERPILLAR ATTACK OF GRAPE VINES.

"T. J. F.," Lucindale, is troubled by a caterpillar which he reports eats the young leaves of his grape vines.

The Horticultural Instructor (Mr. Geo. Quinn) advises him to spray the foliage of the vines thoroughly with arsenate of lead, using it at the rate of one $\frac{1}{4}$ gall. of water, if it is bought in the powdered form, but if as paste, four $\frac{1}{4}$ gall. of water.

POULTRY LICE.

Big Swamp Agricultural Bureau.—The Poultry Expert (Mr. D. F. Lamp) states that poultry lice (parasites) are of two kinds as regards habits, viz., those which live permanently on the birds and those which infest the crevices, &c., of a poultry-house and under the loose bark of trees. Those on the body may be destroyed by dusting the birds with a good insect powder, taking care the powder reaches the skin. Another remedy is to dip in Cooper's sheep dip, half strength, choosing the morning of a warm day. Parasites in the poultry houses, red mites, and ticks are destroyed by abolishing all unnecessary work and old box nests and saturating the building with kerosene, repeating at intervals throughout the summer.

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CURRIE STREET.**

REPORT ON THE FIRST YEAR OF OPERATIONS OF THE MOUNT GAMBIER AND DISTRICT HERD TESTING ASSOCIATION.

[By ARTHUR J. PERKINS, Director of Agriculture.]

Mount Gambier and Moorak dairymen joined together last year and formed the second Herd Testing Society in South Australia. They commenced operations on the 1st of August, 1922, under the name of Mount Gambier and District Herd Testing Association. The first year of operations closed, therefore, on the 31st of July last, and I submit herewith a general report on the same.

1922-23 COMBINED ASSOCIATION RESULTS.

General returns from all herds in the Association are shown in summary in Table I. below:—

*TABLE I.—Showing Combined Results of Mount Gambier and District
Herd Testing Association for 1922-23.*

Month.	Average	Average	Average	Milk	Butterfat	
	Cows Under Test.	Cows in Milk.	Butterfat Test.	Produced by Assn.	Milk per Cow.	Produced by Assn. per Cow.
1922-23.	Cows.	Cows.	Per cent.	Lbs.	Lbs.	Lbs.
August	383.2	282.3	4.13	223,861	584.2	9,245.0
September	369.9	315.0	4.05	257,823	697.0	10,435.5
October	377.8	334.0	4.24	279,051	738.6	11,829.2
November	382.5	351.8	4.01	289,710	705.1	10,806.7
December	380.0	359.9	4.36	215,488	567.0	9,391.9
January	376.5	321.2	4.22	176,159	167.8	7,429.0
February	375.8	298.0	4.33	125,064	332.8	5,409.5
March	308.6	234.7	4.48	96,953	314.2	4,339.2
April	304.2	205.1	4.64	64,722	212.8	3,001.6
May	299.4	165.9	4.52	58,837	196.5	2,663.7
June	294.4	146.1	4.21	55,364	188.1	2,330.8
July	288.2	160.2	4.00	78,060	270.9	3,119.3
Means	345.0	264.5	4.21	—	5,509.8	—
Total production for year				1,901,092		80,001.3
				lbs. milk.		lbs. butterfat.

Outstanding features in these results may be summarised as follows:

1. The mean number of cows under test for 12 months was 345.
2. The mean number of cows in milk over the same period was 264.5, or 76.7 per cent of the total number of cows in the herds. This represents a mean milking period of 280 days in 12 months.
3. The mean output of milk per cow per annum was represented by 5.5galls., or 1.97galls. per day over the mean milking period of 280 days, or 1.51galls. per day over full period of 12 months.
4. The mean butter fat test was 4.21 per cent.

5. The mean output of butter fat per cow per annum was represented by 231.9lbs., or 0.83lbs. per day over the mean milking period of 280 days, or 0.64lbs. per day over the full period of 12 months.

6. On the basis of a 15 per cent. over-run, this would represent 266.68lbs. of butter per cow per annum, or 6 $\frac{2}{3}$ lbs. of butter per week over the mean milking period of 280 days, or 5 1-10lbs. of butter per week over the full 12 months.

7. Mean milk yields per cow were fairly heavy in spring and early summer, reaching a maximum of 73.86galls. per cow in October. From December onwards supplies declined rapidly, reaching a minimum of 18.81galls. per cow in June. It is clear that adequate feeding was not provided when the flush of spring supplies was over. It is probable, too, that effective shelter was lacking during the bleak wet winter months.

8. Butter fat production per cow has followed somewhat similar lines. Maximum production per cow was registered in October, 31.3lbs., and minimum in June, 7.9lbs.

COMPARISON WITH MURRAY BRIDGE HERD TESTING RESULTS.

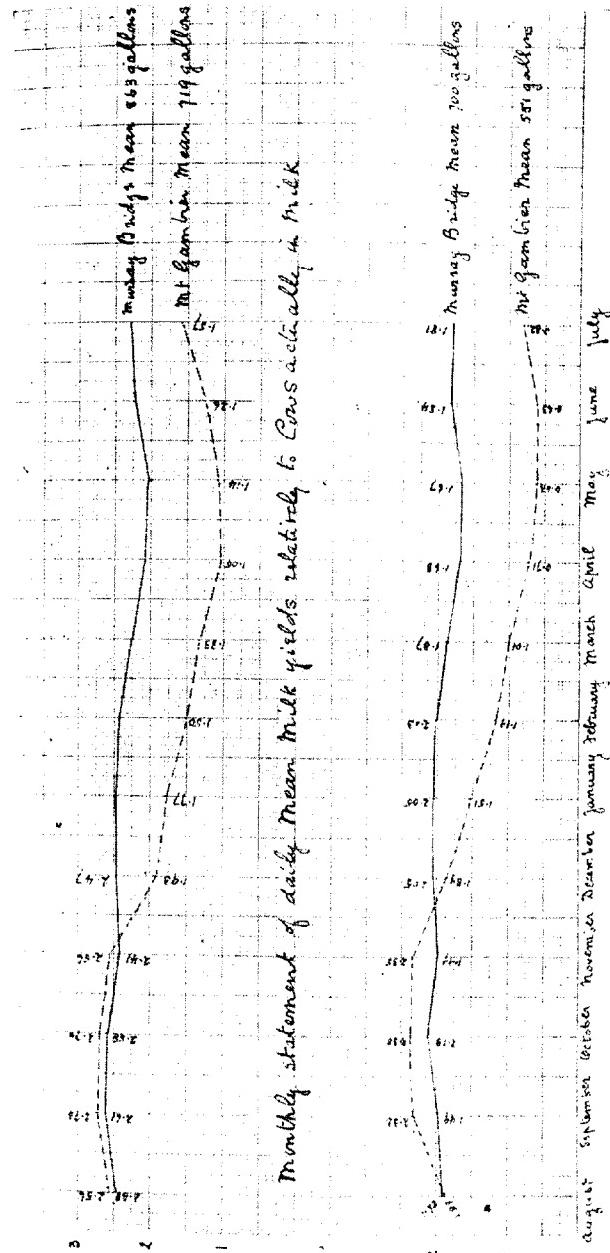
Without in any way desiring to minimise the results secured at Mount Gambier, I think it necessary to contrast them with similar results secured elsewhere. I realise, of course, that climate and local conditions generally must be taken into consideration in any such comparison. Nevertheless, I take it that this comparison should have a stimulating influence on the district, since it is certain that Mount Gambier dairymen could do very much better than they have done over the relatively lean portions of the year.

Outstanding points of comparison have been summarised in Table II.

TABLE II.—*Mount Gambier and District General Results (1st year) Contrasted with those of River Murray (1st and 2nd year)*

	Mt. Gambier and District.	River Murray.		
		1st Year.	1st Year.	2nd Year.
Mean number of cows in herds	345	306	291	
Mean percentage of cows in milk	76.7	83.9	81.1	
Mean milking period (days)	280	306	296	
Mean 12 months' output of milk (galls.)	551	685	700	
Mean butterfat test (per cent.)	4.21	4.36	4.38	
Mean 12 months' output of butterfat (lbs.)	231.9	298.6	306.3	
Estimated weekly production of butterfat over 12 months	5.13	6.59	6.76	

It will be observed that from the point of view of combined herds, the results are all in favor of the River Murray Herd Testing Association. It should not, however, be assumed that this is wholly the natural consequence of more favorable conditions. We shall indeed



Monthly Statement of Daily Mean Milk Yield relatively to all Cows in Herds whether Dry or in Milk.

have occasion to note later that the records of some of the Mount Gambier Herds are exceedingly meritorious; and it follows that if the mean results of the Mount Gambier herds are appreciably below those of the River Murray, it is largely because of certain defects in practice which it should be possible to correct. Indeed, this I take to be one of the main purposes of Herd Testing Associations.

One outstanding feature leading to reduced yields, is the fact that the mean number of days cows continued in milk was greater on the River Murray—306 and 296 respectively—than at Mount Gambier—280 days. This may be the consequence of the type of cow kept, or a matter of management; I suspect the latter. In order to make clear the main lines of weakness, I have analysed the position month by month, as indicated in Table III.

TABLE III.—*Showing Month by Month Mean Percentage of Cows in Milk, and Mean Daily Yield of Milk Relatively (a) to Total Cows in Herds, and (b) to Cows Actually in Milk (Mount Gambier and District).*

	Percentage of Cows in Milk. Per Cent.	Mean Milk Yields per Day Relatively to Cows in Herd. Cows in Milk.	
		Galls.	Galls.
August	73.7	1.88	2.56
September	85.2	2.32	2.73
October	88.4	2.38	2.70
November	92.0	2.35	2.56
December	94.7	1.83	1.93
January	85.3	1.51	1.77
February	79.3	1.19	1.50
March	76.1	1.01	1.33
April	67.4	0.71	1.05
May	55.4	0.63	1.14
June	49.6	0.63	1.26
July	55.6	0.87	1.57

It can be seen that from April to August milk production was at a very low ebb; and in spite of relatively high output from August to December, the total for the year is far from satisfactory.

I have endeavoured to illustrate this point graphically in comparison with the second year results of the River Murray Herd Testing Association. It will be noted how steady was the production of the Murray Bridge herds from one end of the season to the other; a clear indication of good consistent feeding. And notwithstanding the fact that mean production was heavier at Mount Gambier from August to November, the mean output for the year was 700galls. on the River, and only 551galls. at Mount Gambier. I am forced to the conclusion, therefore, that Mount Gambier herds have been insufficiently fed over the bulk of the year, and have probably suffered from undue exposure during bleak winter months.

PERFORMANCES OF INDIVIDUAL HERDS.

We may now pass on to a consideration of returns from the point of view of individual herds: these have been summarised in Table IV.

TABLE IV.—*Showing Individual Results of Mount Gambier Herds in 1922-23 Season.*

Herd.	Period Under Test: Months.	Mean Cows in	Mean Cows in	Milk.		Mean Butterfat.		
		Herd.	Milk.	Total Lbs.	Per Cow. Lbs.	Test. Per cent.	Total Lbs.	Per Cow. Lbs.
2/R	12	15.8	13.6	138,737	8,792.7	4.39	6,085.5	385.8
2/J	12	12.4	10.5	93,929.5	7,389.3	4.32	4,040.7	318.6
2/G	12	11.1	9.3	72,286	6,461.3	4.44	3,190.6	285.3
2/K	12	20.2	16.3	124,223	6,117.8	4.28	5,307.1	261.3
2/C	12	20.3	17.0	132,213	6,400.0	4.00	5,286.1	255.5
2/F	12	20.0	15.0	111,416	5,570.8	4.13	4,597.6	229.9
2/L	12	14.3	10.7	81,408	5,529.0	4.12	3,357.7	227.8
2/H	12	26.7	21.7	144,975.5	5,322.0	4.17	6,052.2	222.1
2/I	12	32.3	24.6	148,834	4,551.4	4.56	6,785.3	207.7
2/A	12	20.2	14.7	95,053.5	4,818.9	4.30	4,088.8	207.1
2/D	12	13.5	9.5	64,282.5	4,726.6	4.00	2,568.3	188.7
2/Q	12	33.0	21.7	149,690	4,536.0	4.10	6,135.0	185.9
2/O	12	41.7	29.8	179,917	4,204.3	4.97	7,316.1	170.8
2/N	12	13.9	9.8	54,568.5	3,719.9	4.05	2,210.1	150.9
2/B	12	7.0	5.5	60,379.5	8,635.1	4.17	2,519.5	360.3
2/G	12	2.8	2.6	23,768	8,751.2	3.54	1,079.6	395.0
2/M	7	65.9	53.7	217,214.5	3,294.5	4.17	9,045.9	137.3
2/P	1	15.0	12.6	8,196.5	546.3	4.09	335.0	22.2
Means	11.1	20.7	15.9	—	5,509.8	4.21	—	231.9
Total production for year				1,901,092 lbs. milk.			80,001.3 lbs. butterfat.	

Three prizes are offered annually by Government with the stipulation that cows under test must not be less than 10 in each winning herd, and that the mean butter fat output per cow per annum in each winning herd shall be not less than 300lbs. per cow per annum. It follows that Herd 2/G (2.8 cows) and Herd 2/B (7 cows), the yearly outputs from which were highly satisfactory, could not compete. Unfortunately, two other herds only exceeded the 300lbs. mark, and were awarded respectively first and second prizes. These herds were:—

First Prize, £75—Herd 2/R (Mr. E. Tollner), 879.27galls. of milk, and 385.81lbs. of butter fat per cow per annum.

Second Prize, £25—Herd 2/J (Messrs. J. L. Heaver & Son), 738.93galls. of milk, and 318.55lbs. of butter fat per cow per annum.

The results secured by the winning herds compare very favorably with those secured by the best herds of the River Murray Herd Testing Association. Indeed, Mr. Tollner's mean yield of butter fat—385.81lbs.—exceeds Mr. Halliday's best record by over 16½lbs. This is clear proof, if any were needed, that Mount Gambier conditions do not necessarily imply a relatively low milk output. In the circumstances, a close analysis of Mr. Tollner's results is well worth while.

HERD 2/R (MR. E. W. TOLLNER):

The Assistant Dairy Expert (Mr. H. J. Apps) reported as follows on Mr. Tollner's Herd at the conclusion of the first year of operations of the Herd Testing Association:—

"The 16 members of this herd consists of crosses and grades of Jersey, Ayrshire, and Shorthorn blood. The general type of this herd is somewhat irregular, but 10 of them are of nice conformation, and all of the cows are in splendid milking condition, which is so essential with good dairy cows, and reflects great credit on the owner, showing that they have been extremely well cared for. An inspection of this herd at this period of the year is well worth a visit by other members of the Society. The herd bull is an Ayrshire."

The herd consisted of:—

Cows on their first calf	2
4 years old	2
5 years old	3
Aged	14
<hr/>	
Total,	21

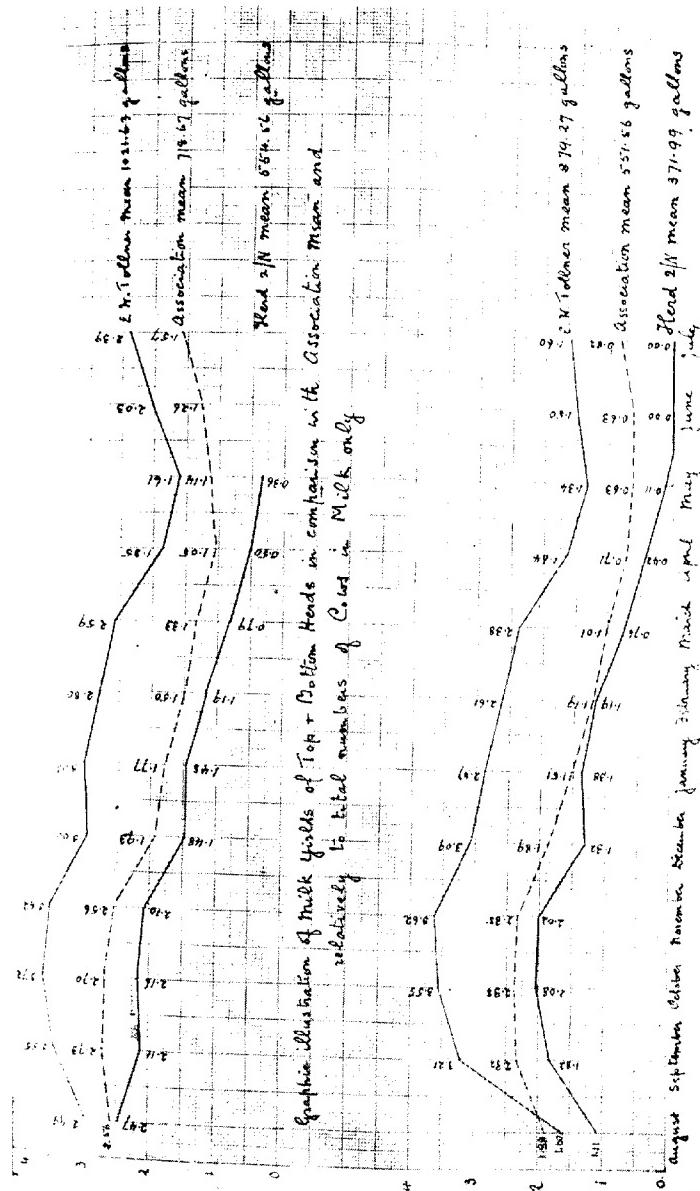
In order to make clear how meritorious were the performances of Mr. Tollner's herd, I shall contrast them in summary with those of the Association as a whole, and those of Herd 2/N at the bottom of the list:—

TABLE V.—*Contrasting Performances of Mr. Tollner's Herd with those of the Association as a Whole, and of Herd 2/N.*

	Association		
	Mr. Tollner's Herd.	Combined Herd.	Herd 2/N.
Mean number of cows in herd	15.84	345.04	13.92
Mean number of cows in milk	13.58	264.53	9.84
Percentage of cows in milk	85.73	76.67	70.69
Mean milking period (days)	313	280	258
Mean milk per cow per annum (galls.) . .	879.27	550.98	371.99
Mean butter fat test (per cent.)	4.39	4.21	4.06
Mean butter fat per cow per annum (lbs.)	385.81	231.86	150.96
Mean butter per cow per week (lbs.)	8.53	5.13	3.34

It will be observed that Mr. Tollner's herd averaged 328.29galls. more milk per cow than the mean of the combined herds of the Association, or an increase of 59.6 per cent., and 507.28galls. more than Herd 2/N, or an increase of 136.4 per cent. It also averaged 153.95lbs. of butter fat per cow more than the mean of the combined herds, or an excess of 66.4 per cent., and 234.91lbs. more than Herd 2/N, or an excess of 155.7 per cent.

From the money point of view, and with milk at 10d. per gallon, Mr. Tollner's cows averaged £36 12s. 9d. each, against £22 19s. 2d. for the Association mean, and £15 10s. for the cows of Herd 2/N.



Graphical Illustration of Daily Milk Yields of Top and Bottom Herds in comparison with Association Mean and relatively to total numbers of Cows in Herds.

On the other hand, on a basis of 1s. 6d. a pound for butter fat—its present approximate value—and 2d. a gallon for skim milk, Mr. Tollner's cows earned £35 3s. 5d. each, as against £21 5s. 10d. for the Association mean, and £14 2s. 11d. for the cows of Herd 2/N.

Finally, as the matter is of considerable interest from the point of view of those whose results have been less satisfactory, I have indicated below, month by month, the mean daily milk yield of Mr. Tollner's cows in comparison with those of the Association mean, and of Herd 2/N, both relatively to total number of cows in the herds, and relatively to those actually in milk at the time.

TABLE VI.—*Showing Month by Month Mean Daily Milk Yields of Mr. Tollner's Cows in Comparison with the Association Mean and those of Herd 2/N.*

Relatively to cows in herd:—

	Association		
E. W. Tollner.	Mean.	Herd 2/N.	
	Gals.	Gals.	Gals.
August	1.60	1.88	1.11
September	3.21	2.32	1.82
October	3.55	2.38	2.09
November	3.62	2.35	2.02
December	2.99	1.83	1.32
January	2.87	1.51	1.38
February	2.61	1.19	1.19
March	2.38	1.01	0.76
April	1.64	0.71	0.42
May	1.34	0.63	0.14
June	1.53	0.63	—
July	1.60	0.87	—
Mean	2.41	1.51	1.02

Relatively to Cows actually in milk:—

August	2.99	2.56	2.47
September	3.55	2.73	2.11
October	3.72	2.70	2.16
November	3.62	2.55	2.10
December	3.00	1.93	1.48
January	3.06	1.77	1.48
February	2.80	1.50	1.19
March	2.59	1.33	0.79
April	1.85	1.05	0.50
May	1.61	1.14	0.36
June	1.97	1.26	—
July	2.39	1.57	—
Mean	2.80	1.97	1.52

In summary, then, taking all cows present in the herds, Mr. Tollner's cows averaged over 365 days close on a gallon of milk a day in excess of the Association mean, and 1½galls. in excess of cows in Herd 2 N. Figures in this table have been given graphic illustration herewith.

Mr. Tollner's cows were grazing from August to November inclusively; thereafter they were regularly fed, first with green oats in December; and subsequently with chou moellier from January to July inclusively, together with chaff and boiled barley, to which bran was added in July. Mr. Tollner's weakest month appears to have been May—and it seems probable that winter production would have been maintained at an even higher level, had bran been introduced into the feeding ration somewhat earlier.

Mr. Tollner is much to be congratulated on the results achieved, and it is to be hoped that others will attempt to emulate them in the Association's subsequent year.

HERD 2/J (MESSRS. J. L. HEAVER & SON).

Messrs. J. L. Heaver & Son were winners of the second prize with a mean butter fat output of 318.55lbs. per cow. The Assistant Dairy Expert (Mr. H. J. Apps) reports as follows on their herd at the completion of the first year's operations:—

"The 11 cows in this herd consist of crosses and grades of Shorthorn and Ayrshire blood of fair type and in fair condition. The herd sire is an Ayrshire."

The herd is composed as follows:—

Three years old	5
Four years old	1
Five years old	2
Aged	5
<hr/>	
Total,	13

Details concerning the performances of this herd may be summarised as follows:—

Mean number of cows in herd	12.36
Mean number of cows in milk	10.45
Percentage of cows in milk	84.55
Mean milking period (days)	309
Mean milk per cow per annum (galls.) . .	738.93
Mean butter fat test (per cent.)	4.32
Mean butter fat per cow per annum (lbs.)	318.55
Mean butter per cow per week (lbs.) . . .	7.04

In this herd the mean daily milk production relatively to total cows in the herd was represented by 2.02galls. over 365 days, or about half a gallon above the Association mean. Similarly the mean daily output of butter fat was 0.87lbs., or about 36 per cent higher than the Association mean output.

The performances of this herd show considerable irregularity, according to the period of the year considered. During the grazing months—August to December inclusive—milk yields were at the rate of over 3galls. to the cow. January and February, with an abundance

of chou moellier and oaten hay, continued to yield 2½galls. per day. March and April yields fell to 1½galls. and 1gall.: whilst from May to July inclusively mean yields were low from the presence of a large proportion of dry cows in the herd.

On the whole, results were fairly satisfactory, but it might be suggested that more stimulating feeding, in the shape of bran or crushed oats, would after December lead to more consistently heavy output of milk.

THE REMAINING HERDS.

I submit a few notes on the remaining herds which completed 12 months' tests, but were not prize winners.

Herd 2/E.—Mean milk yield per cow, 646.13galls.; and butter fat, 285.25lbs., from a mean of 11.14 cows. Mr. Apps reports as follows:—

“The 11 cows in this herd are Jersey and Shorthorn crosses, and with the exception of two possess very fair type and fair condition. The herd bull is an Ayrshire.”

Herd 2/K.—Mean milk yield per cow, 611.78galls.; and butter fat, 261.34lbs., from a mean of 20.22 cows. Mr. Apps reports as follows:—

“This herd of 21 cows is made up of Jersey and Shorthorn crosses, and Red Poles possessing medium type and fair condition. The herd bull is a Red Pole.”

Herd 2/C.—Mean yield production per cow, 640galls.; and mean butter fat, 255.45lbs., from a mean of 20.33 cows. Mr. Apps reports as follows:—

“This herd of 19 cows possessing mainly Jersey and Shorthorn crosses are of medium type, and their condition is very fair. The herd sire is an Ayrshire.”

Herd 2/F.—Mean milk production per cow, 557.08galls.; and mean butter fat, 229.9lbs., from a mean of 20 cows. Mr. Apps reports as follows:—

“The 20 cows in this herd are crosses of the Jersey and Short-horn breeds. They possess fairly good dairy type, and are in medium condition. The herd bull is a Friesian.”

Herd 2/I.—Mean milk production per cow, 552galls.; and butter fat, 227.76lbs., from a mean of 14.26 cows. Mr. Apps reports as follows:—

“The 12 members of this herd are not uniform in type, but are in fair condition. The herd bull is a Shorthorn-Jersey cross.”

Herd 2/H.—Mean milk production per cow, 532.20galls.; and butter fat, 222.05lbs., from a mean of 26.69 cows. Mr. Apps reports as follows:—

“This herd of 24 cows comprises grades and crosses of Jersey, Ayrshire, and Shorthorn breeds. They possess fair type and fair condition. The herd sire is a Friesian.”

Herd 2/L.—Mean milk production per cow, 455.44galls.; and butter fat, 207.68lbs., from a mean of 32.3 cows. Mr. Apps reports as follows:—

“This herd of 31 cows consists of Jersey and Ayrshire crosses. The general type is irregular, but they are in fair condition. The herd sire is a Jersey.”

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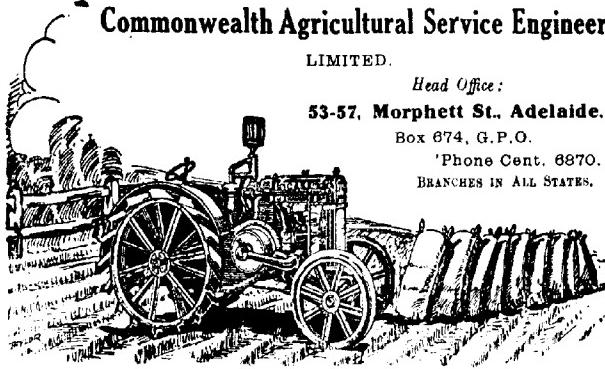
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BRANCHES IN ALL STATES.



Herd 2/A.—Mean milk production per cow, 481.89galls.; and butter fat, 207.05lbs., from a mean of 20.19 cows. Mr. Apps reports:—

“The 20 cows in this herd are of the Shorthorn-Jersey cross, possessing fair type and, in fair condition. The herd bull is of Shorthorn breeding.”

Herd 2/D.—Mean milk production per cow, 472.66galls.; and butter fat, 188.71lbs., from a mean of 13.53 cows. Mr. Apps reports:—

“The 13 cows in this herd consist of Jersey and Shorthorn crosses of fair type and condition. The herd sire is an Ayrshire.”

Herd 2/Q.—Mean milk production per cow, 453.6galls.; and butter fat, 185.91lbs.; from a mean of 33 cows. Mr. Apps reports as follows:—

“This herd of 33 cows consists of Shorthorn, Jersey, and Hereford crosses: the type is irregular, but the condition fair. The herd sire is a Shorthorn.”

Herd 2/O.—Mean milk production per cow, 420.43galls.; and butter fat, 170.8lbs., from a mean of 41.74 cows. Mr. Apps reports as follows:—

“This herd consists of 38 head of Jersey and Ayrshire crosses. They possess fair type, but are hardly in fair condition. The owner has decided to discard several cows as a result of last season's tests. The herd bull is an Ayrshire.”

Herd 2/N.—Mean milk production per cow, 371.99galls.; and butter fat, 150.9lbs., from a mean of 13.92 cows. Mr. Apps inadvertently missed this herd whilst on his tour of inspection.

CHANGES IN THE HERDS IN 1922-23.

Changes in the various herds by deaths, sales, purchases, etc., may take place during the course of a season, and are naturally taken into account in averaging out results. The following summary indicates the changes that took place in 1922-23 season.

	Head.
Opening numbers	395
Purchases	11
Heifers on first calf	17
	<hr/>
	423
	<hr/>
Sales	45
Resignation of owner	83
Deaths	12
	<hr/>
	140
	<hr/>
Total numbers	423
Less reductions	140
	<hr/>
Closing numbers	283

OWNER'S SELECTION AGAINST RESULTS.

When the Association started in August, 1922, I asked each member to indicate what he considered to be his best two and worst two cows. We shall now see to what extent casual judgment has been borne out by actual tests.

Best Cow.—Out of 13 owners, only four were able to indicate their best cow. In two cases, cows indicated as best came second; in three cases, third; in one case, fifth; in another, sixth; in another, eighth; and in another, tenth.

Second Best Cow.—Out of 15 owners, only two were able to point to their second best cow. In two cases the cow indicated as best came second. In three cases cows indicated as second best came third; in one case, fourth; in three cases, fifth; in two cases, sixth; in one case, seventh; and in another, fifteenth.

Worst Cow.—Out of 13 owners, only two were successful in indicating their worst cow; and in one instance the cow indicated as worst turned out on test to be the best. Others varied within wide limits, the most glaring examples being: in a herd of 41 the owner's worst cow came 20th; in another herd of 33 the owner's worst cow came 11th; in another herd of 30 the owner's worst cow came 18th, etc.

Next to Worst Cow.—Out of 12 owners, only three were able to pick their next to worst cow; and in one case only did the worst cow come next to worst. Other selections showed a wide range of variation.

These facts go to prove how difficult it is for a dairyman to judge the revenue-earning capacity of individual cows without the assistance of accurate records.

CONCLUSIONS.

The main object of Herd Testing among dairymen, it has already been stated, is to improve the output of milk and butter fat of the average cow. Data indicated for the Mount Gambier and District Association show that there is ample room for improvement. True, the performances of one herd were exceptionally good, and show what can be done in the district with good cows under efficient management. On the other hand, of the 14 herds averaging more than 10 head, which completed 12 months' test, nine averaged less than 600galls. of milk per cow, and six less than 500galls. These are figures which, it is hoped, will be rectified in the future. The main weakness appears to be a rather high proportion of unprofitable cows, and defective feeding methods over five to six months of the year. It is probable, too, that lack of shelter during the winter months will contribute towards the low winter output. I hope to be in a position to record marked improvement in the next season.

TAKE-ALL INVESTIGATIONS.

[GEOFFREY SAMUEL, B.Sc., Lecturer on Plant Pathology, University of Adelaide.]

The serious nature of the Take-all disease of wheat in the newer wheat-growing areas of South Australia has led to arrangements being made with the Department of Agriculture for an extended investigation of the disease at the Laboratory for Plant Pathology at the University, in order to discover the best methods of control for this pest. It is very generally recognised that the disease does most harm in the more recently opened-up mallee districts, and as the district round Pinnaroo is one which suffers perhaps more than any other, this was visited early in November in order to see the disease in the field, and obtain specimens with which to work in the laboratory. Through the courtesy of the local Branch of the Agricultural Bureau, which provided transport facilities, it was possible to visit a large number of farms and collect many samples.

It is well-known that now that the Take-all disease is caused by a minute parasitic fungus, which enters the roots of healthy wheat plants and feeds on the tissues of the roots and the bases of the stems, so that the wheat plant sooner or later dies. The black discolouration at the base of infected plants is due to this minute parasitic fungus, but the fungus itself is so small that its form can only be distinguished with the aid of a microscope.

There are two lines upon which an investigation of this disease must proceed at the commencement, but as the work progresses these should eventually supplement one another completely. In the first place the parasite which causes the disease in the wheat must be isolated in the scientific laboratory and its life-habits studied with the microscope and by other means, so that we can understand exactly how and when it attacks the wheat plant, and can judge and experiment with the best methods and time for killing it. In the second place careful observation and study of the occurrence of the disease in the field may be expected to indicate useful methods of controlling it; for on visiting a Take-all infected district it is immediately evident that all crops are not equally infected. Crops on equally similar soil, with similar rainfall and climatic conditions, may be affected to a very different extent during the same season, while the degree of infection may vary from year to year on the same land. It is thus evident that by studying the history of land carrying healthy crops as well as of land carrying diseased crops, facts may be brought to light indicating which treatment of the land, and system of manuring, tends to check the disease, and which to favour it.

Both these lines of investigation will be followed up in the work being done on Take-all. The investigation of the parasitic fungus in the laboratory has already commenced, but this part of the work requires careful study and a long time to complete. On the other hand

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the observations made on the crops at Pinnaroo indicate possibility of a much better control of the disease by attention to certain cultural methods. Some account of these observations is here given.

From a review of the crops inspected the following statements are found to apply in the majority of cases:—The crops which suffered most from Take-all were those following grassland; if there had been a year of fallow the attack was not so bad; and if the grassland had been burnt before fallowing the crops were still better than in the previous case.

These facts immediately suggest that grassland is a carrier of the Take-all disease; and so specimens of grasses from pastureland were taken for examination. Of fourteen different kinds of grasses examined, only two have so far been found to be affected by the Take-all disease.¹ These are barley-grass² and silver-grass,³ unfortunately the two dominant grasses in the pasture. Of these silver-grass is very rarely infected, and then only slightly; whereas barley-grass is very badly attacked over a wide area. In many pastures near Pinnaroo it is difficult to find any parts free from Take-all infected barley-grass. This, then, is probably the explanation of the badly infected crops when grassland is ploughed in just before sowing. The Take-all fungus can live for some time in the soil on any pieces of ploughed-in grass or stubble, so that when barley-grass pasture is ploughed in before seeding, there may be Take-all practically all over the field ready to attack the young seedlings. Barley-grass on the fallows also may act as a carrier of Take-all, which fact shows the great importance of keeping the fallows clean.

This bad Take-all infection on barley-grass raises the question whether it would not be better to try to cut grassland out of the rotation in the Pinnaroo area for some years. A rotation such as wheat-oats-bare fallow, or even wheat-oats-oats-bare fallow, might do much to check the disease. If necessary for stock, permanent pasture might be established, perhaps with a better grass than barley-grass.

Burning the grassland on the stubble is beneficial. This was evident from comparison of crops sown on burnt and unburnt land, but is what might be expected, for the Take-all fungus is killed by burning. The stronger the burn the greater the number of disease germs killed. It is not yet certain whether a very strong burn can kill *all* the fungus, but this is unlikely, for the fungus goes some distance down into the soil on the roots of diseased plants.

Another advantage in a burn is that there is not a quantity of dead wheat or grass to be ploughed in on which the fungus can grow. Then if the fallows are kept clear of all grasses by good cultivation, much of the fungus in the soil germinates with the rains, and, finding no wheat or grass to grow on, eventually dies from starvation. The more frequent the cultivation the more completely the fungus can be got

1. The diagnosis is based on the characteristic plate-mycelium only for the present. The specimens will be kept for the development of perithecia. 2. *Hordeum murinum*, L. 3. *Festuca bromoides*.

rid of. (This recommendation for burning only applies, of course, where Take-all has been in the field. When the field is clean, and free from Take-all, there are many advantages in ploughing in stubble.)

There is one other helpful practice which has frequently been emphasised by Mr. Spafford; that is, rolling. When thorough cultivation has made a good even seed-bed this is not so necessary; but where it has not been possible to cultivate sufficiently, and it is suspected that the seed-bed and the soil below are not properly compacted, rolling is said to have a very beneficial effect.

Further it was noticed that in the majority of cases the early wheats were not so badly attacked as the late varieties. No definite explanation can at present be offered for this. More work in the laboratory and in the field on time of infection, stage of infection, temperature for infection, &c., may give the correct explanation later on. This observation could be utilised to some extent even now, however, by sowing early varieties in preference to late on land which is still suspected to contain Take-all disease.

The use of heavy dressings of superphosphate has been found largely to control Take-all on the West Coast, but no comparisons could be made between heavily and lightly dressed crops at Pinnaroo, because 60-90lbs. was the average dressing used on practically all farms. One farmer, however, had sowed a strip with 2ewts. super alongside ones with 90lbs. and 56lbs. The strip which had received 2ewts. was certainly free from Take-all, but the one with 90lbs. was also almost free; there was more Take-all on the 56lbs. strip. This single experiment is not sufficient to justify the formation of a definite opinion on the effect of different dressings of super on the Take-all disease in Pinnaroo soils. It is hoped to carry out more extensive experiments on manurial treatments next year.

A question which may now be raised in connection with the greater prevalence of Take-all in recently opened up mallee lands is this:—Is it due to some factor in the soil, and if so, what? Is there something more than the abundance of Take-all infected barley-grass at Pinnaroo, which may help to account for the greater susceptibility of this land to Take-all?

Some work done by R. S. Kirby on the Take-all fungus in America suggests a line of investigation of this. Kirby finds that the fungus grows best on substances with alkaline reaction, and that substances with an acid reaction tend to stop the growth of the fungus. May it be, then, that the soil solution in Pinnaroo soils is more alkaline¹ than in areas where Take-all is less destructive, and this is to some extent explains its greater severity at Pinnaroo?

In this connection it is interesting to recall the history of the Lower Northern areas and of Yorke's Peninsula. It is well-known that Take-all was formerly very prevalent in both these areas, but now occurs only rarely. Is this to be explained by improvement in cultivation methods, or by some increase in the acidity of the soil, or perhaps by

¹. This does not refer to the absolute alkalinity, or lime-content, of the soil, but to the reaction of the *soil-solution*.

both acting together? It is known from experience in other parts of the world that alkaline soils, when brought into cultivation, become generally less alkaline owing to the ploughing in of plant remains and the consequent formation of humic acids. No figures as to the reaction of the agricultural soils of South Australia are available, however, a fact which emphasises once again the need for a soil survey of this State. In order to test the above question, therefore, soil samples were taken at Pinnaroo and these will be compared with samples from other areas. The details of these tests, and a discussion of their relation to Take-all will be published in future numbers of the *Journal of Agriculture*, in the periodical progress reports of the investigations.

A brief summary of what is so far known of the control of Take-all by cultivation may be given thus:—

Burn the stubble early after Take-all.

Fallow early.

Keep the fallows clean, especially from barley-grass, by cultivating.

Cultivation also makes a better seed-bed.

Roll if the seed-bed is not well compacted.

Use more superphosphate (1cwt. per acre is suggested for Pinnaroo until further experiments are made).

Consider taking grassland out of the rotation in bad Take-all areas. Wheat-oats-bare fallow or wheat-oats-oats-bare fallow are suggested.

Sow early wheats if Take-all is still suspected to be in the land.

ORCHARD NOTES FOR SOUTHERN DISTRICTS.

[By C. H. BEAUMONT, Orchard Instructor and Inspector.]

Spraying must be kept going against codlin moth; a light coat of arsenate of lead should always show on the fruit.

Where trees have been pruned heavily, watch the young shoots and rub off any not required; in the same manner look after grafts and if necessary give them support. Young vines should be tied to stakes or the trellis wire. Trees cut back for budding should have all shoots removed except those required for the new buds.

If the weather becomes very hot give any newly planted trees some water and mulch.

Give special care to the picking and grading of fruit and send it to the user clean and fresh and whole; have an even quality and size right through the package, it will mean a better price and entire satisfaction.

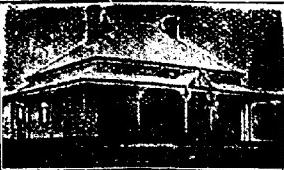
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WHEN IS WATER SAFE FOR IRRIGATION PURPOSES?

[By ARTHUR J. PERKINS, Director of Agriculture.]

Samples of water are frequently sent to us with the request that they be analysed and advice tendered as to their suitability for irrigation purposes. Unfortunately, the position is a complicated one, and one not dependent solely on the results of analysis. Much depends upon soil conditions, and particularly, perhaps, on subsoil conditions, with which is intimately connected the all important question of natural drainage. The soil, itself, for example may already be more or less heavily charged with injurious saline matter; and if irrigation waters add to this condition, the danger limit may soon be reached.

Again, the soil may have a large natural supply of lime or gypsum: in which circumstances plant growth shows a greater tolerance for injurious salts than would otherwise be the case. But the chief factor is probably the subsoil and its tendency to offer good or bad natural drainage. If the character of the subsoil is such as to offer good natural drainage conditions, *i.e.*, if it is naturally pervious to water or if relatively to surface levels it offers steep inclines down which superfluous water is able to flow, then relatively saline water, if intelligently handled, may prove perfectly safe for irrigation purposes.

On the other hand, if natural drainage conditions should be defective and surplus waters tend to stagnate at shallow distances from the surface, salts will gradually accumulate in the land and, under the influence of surface evaporation, concentrate near the

surface with disastrous consequences to surface vegetation. It follows, therefore, that waters which might be quite safe for irrigation purposes in some soils must prove dangerous in others.

Hence, apparent contradiction in views held on the subject by various authorities. Thus, Hildgard states very definitely that in California 70 grains of injurious salts to the American gallon (equivalent to 83.9 grains to the English gallon) is the extreme limit of tolerance for ordinary plant growth. On the other hand, T. H. Means, reporting on irrigation methods as practised in the Oases of the Sahara Desert, states, that water reaching 560 grains of total salts to the gallon, 50 per cent. of which is common salt, is used successfully for irrigation purposes. Similarly, in certain parts of New Mexico water going from 280 to 350 grains to the gallon appears to be freely used.

It should be observed here that irrigation water which ultimately leads to vegetation troubles is not necessarily in itself hurtful, or at a dangerous state of concentration. Thus in water culture, wheat seedlings can be grown successfully in the presence of common salt, at the rate of 180 grains to the gallon. The same water, if applied as irrigation water under defective drainage conditions, would, in the course of time, lead to soil sterility. Everything, therefore, depends upon the extent to which physical conditions favor the local accumulation of salts in zones immediately surrounding the root systems of plants.

This point may be illustrated as follows. Let us suppose that we are using for irrigation purposes water going 150 grains of total solids to the gallon at the rate for the season of two acre feet *i.e.*, about 542,580 gallons to the acre. This would bring to the soil, annually, about 11,600 lbs. of injurious salts per acre. So long as these salts continued in solution in the soil moisture at the rate of 150 grains to the gallon, notwithstanding the largeness of the total quantity, they would do little or no harm to plant life. Similarly, if the bulk of the water not utilised by the roots of plants was removed beyond the reach of the latter by means of natural or artificial drainage, no harm would result. But if the surplus waters remained *in situ*, they would gradually be drawn to the surface by the combined influence of surface tension and surface evaporation and ultimately pass into the atmosphere in the form of vapor. The salts, however, would be left behind and tend gradually to increase the density of soil moisture, particularly in the surface layers which would eventually reach such a state of concentration as to lead to the death of those plants, the roots of which happened to be in contact with it.

Such, then, is a general outline of the position. It occurred to me some time back that from the purely local viewpoint a practical reply to the difficulties which frequently confront us might be found in results of the analysis of local well waters that had long been in use for irrigation purposes. I therefore asked Mr. Quinn, who is well acquainted with local growers adjoining Adelaide, to collect typical samples of water from the neighborhood and to supply details as to results secured and as to particular circumstances under which these

results had been secured. This has been done and the analysis of 14 samples of water carried out by the Director of Chemistry, are shown in Table I.

TABLE I.—*Showing Analysis of Well Waters from Neighborhood of Adelaide.*

	1	2	3	4	5	6	7
J. Bradbrook, Athelstone (Old Well).							
Calcium carbonate	21.5	—	15.5	12.5	24.5	14.5	18.7
Calcium sulphate	5.2	—	5.2	11.3	9.0	—	15.3
Magnesium carbonate	—	—	—	—	7.6	3.6	4.4
Ferric oxide and alumina . .	1.0	2.3	1.5	1.1	0.9	0.6	1.0
Sodium nitrate	—	—	—	—	—	—	10.8
Undetermined	3.3	4.4	2.1	3.2	4.5	0.3	1.8
Harmless	31.0	27.4	27.4	37.8	27.5	23.2	33.3
Calcium chloride	—	—	2.2	—	—	—	—
Magnesium sulphate	22.6	8.3	—	13.7	11.6	10.4	6.9
Magnesium chloride	20.9	36.8	10.7	28.0	12.6	—	16.4
Sodium sulphate	—	—	—	—	—	11.2	—
Sodium chloride	93.3	85.1	76.6	65.4	76.9	60.7	52.1
Injurious	136.8	130.2	119.5	107.1	101.1	82.3	75.4
Total solids	167.8	157.6	146.9	144.9	128.6	105.5	108.7
	8	9	10	11	12	13	14
J. B. Pierson, Hectorville.							
E. C. Short & Sons, Paradise.							
G. Weston, Merton.							
G. Higgins, Paradise Park.							
J. Duncan, Sturt.							
F. T. Pitt, East Marden.							
Martin Bros., Fife.							
Grains per Gallon.							
Calcium carbonate	12.8	9.1	13.5	9.7	10.6	5.8	7.6
Magnesium carbonate	5.2	13.3	5.9	6.6	7.1	3.1	6.2
Ferric oxide and alumina .	0.8	0.5	0.8	1.1	0.8	0.3	0.8
Undetermined	3.7	4.2	3.8	3.3	1.1	1.9	2.4
Harmless	22.5	27.1	24.0	20.7	19.6	11.1	17.0
Magnesium sulphate	4.8	2.6	8.0	5.9	5.3	2.3	2.9
Magnesium chloride	7.5	—	12.6	1.0	3.7	0.3	4.2
Sodium sulphate	—	6.4	—	—	—	—	—
Sodium chloride	61.0	61.4	44.4	32.4	30.0	20.4	12.9
Injurious	73.3	70.4	65.0	39.3	39.0	23.0	20.0
Total solids	95.8	97.5	89.0	60.0	58.6	34.1	37.0

The waters dealt with in Table I. have been placed in the order of their assumed injuriousness to vegetation. Thus, of all samples examined, sample No. 1 from the old well of Mr. J. Bradbrook, of Athelstone, is looked upon as the most likely to give rise to irrigation

troubles. Similarly, sample No. 14, from the well of Messrs. Martin Bros., is judged to be the safest for irrigation purposes. The difference between these two waters may perhaps be emphasized by the following comparative statements relatively to irrigation at the rate of one acre foot, i.e., approximately 271,292galls. to the acre.

J. Bradbrook. Martin Bros.

	Lbs.	Lbs.
Total solids per acre foot of water	6,503	1,434
Harmless salts per acre foot of water	1,201	659
Harmful salts per acre foot of water	5,302	775
Common salt per acre foot of water	3,616	500
Magnesium chloride per acre foot of water . .	810	163
Magnesium sulphate per acre foot of water ..	876	112

A glance at these figures will show how dangerous the water from Mr. Bradbrook's old well is likely to prove if surplus waters be not removed by natural or artificial drainage. Close on 2½ tons per acre of harmful salts for every 271,292galls. of water used must eventually lead to complete barrenness unless drainage conditions are very satisfactory. On the other hand, the relative harmlessness of the water from Messrs. Martin Bros' well must be equally apparent. It is to be observed that the following salts found present in these waters have been classified as harmless:—

Calcium carbonate	Lime
Calcium sulphate	Gypsum
Magnesium carbonate	—
Sodium nitrate	Nitrate of soda
Ferrie oxide and alumina	—

It should be added, further, that some of them, at all events (chiefly lime and gypsum) may be regarded as useful and helpful to plants in their struggle against harmful salts. Waters rich in these salts seem to confer upon plants a certain degree of resistance to the toxic action of some of the harmful salts. On the other hand, the injurious salts revealed by analysis are the following in order of importance:—

Sodium chloride	Common salt
Magnesium chloride	Bittern
Calcium chloride	—
Sodium sulphate	Glauber's salts
Magnesium sulphate	Epsom salts

Fortunately, sodium carbonate (the black alkali of the Americans) does not appear to be present. Of the five salts the three chlorides may be looked upon as the most dangerous to vegetation, probably in the proportion of three to one, relatively to the two sulphates. All five are readily soluble in water, and therefore easily removed from the soil by leaching and drainage should they show a tendency to accumulate therein.

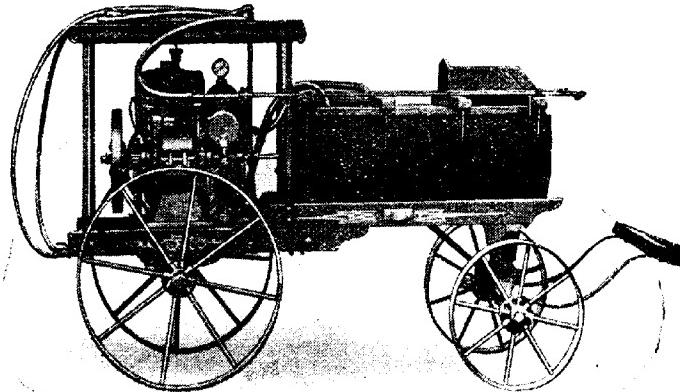
The fourteen samples of water separate out naturally into three classes of varying degrees of toxicity to plant life; these are—

Class A (including samples 1 to 5), in which harmful salts range from 100 to 140 grains to the gallon, representing 3.876lbs.¹⁰ 5,426lbs. to the acre foot of water.

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SPECIAL NOZZLES FOR BLOW-FLY PEST.

Class B (including samples 6 to 10), in which harmful salts range from 65 to 82 grains to the gallon, representing 2,520lbs. to 3,178lbs. to the acre foot of water.

Class C (including samples 11 to 14), in which harmful salts range from 20 to 40 grains to the gallon, representing 775lbs. to 1,550lbs. to the acre foot of water.

Of these three classes, there is no doubt but that waters in Class C alone, with 20 to 40 grains of injurious salts to the acre, can be described as absolutely safe irrigation waters for almost all circumstances. Waters included in the two remaining classes are safe only so long as drainage conditions admit of the complete removal of water not utilised by plant growth, and so long as winter rains are sufficiently heavy to exercise a cleansing influence on the summer irrigated land. Of the two, waters coming under Class A are naturally more dangerous than those coming under Class B. Let us now examine each one of them separately—

CLASS A (100 to 140 grains of injurious salts to the gallon).

All waters in this class are well supplied with lime, which will probably help to reduce the toxicity of the harmful salts, and all, with the exception of sample 5, are provided with the equally useful gypsum. In all five the chief harmful salt is common salt (sodium chloride); in three of them (samples 2, 3, and 4) bittern or magnesium chloride comes next in importance; whilst in the last two samples (1 and 5) bittern and Epsom salts are of equal importance.

Sample 1 (J. Bradbrook, Athelstone).—Mr. Quinn reports as follows on the land and well and the results hitherto secured from the use of the water:—

"Well sunk in 1894. Shaft 98ft., with 100ft. bore in same. Supply approximately 6,000galls. per hour. This well and bore penetrated very hard bluestone strata. The garden is situated on the hill-slopes rising from the Torrens river just below the Gorge. The soil consists of dark iron-stained clay loam intermixed with water-worn gravelly stones giving it a certain degree of friability. The subsoil is a fairly friable clay. Patches of black loamy soil overlie limestone rubble on some ridges to a depth of 9in. to 12in. A small gully is filled with black alluvial deposit several feet deep above gravel. The water has been used on citrus trees which have gone back, but probably as a consequence of unsuitable soil conditions rather than to the character of the water. All kinds of winter vegetables are grown on the slopes in the winter and spring, and in summer, with irrigation, all the melon family, including cucumbers, and the tomato are successfully grown, but French beans are said to fail. The owner attributes their failure to the water. The water is applied mainly in open furrows, and the soil absorbs it freely."

From this very full description we may gather that everything points to excellent natural drainage conditions, and we may assume that tolerably heavy winter rains help to leach out of the soil injurious saline matter which may have accumulated as a result of summer

irrigation. The failure of French beans is significant; and also perhaps that of the citrus trees.

Sample 2 (Col. J. Rowell, Lockleys).—Mr. Quinn reports as follows on the well, soil conditions, and results hitherto achieved:—

"Well sunk in 1901. Depth of shaft 26ft. into gravel. Good supply, claimed to be approximately 8,000galls. to 10,000galls. per hour. Land gently undulating, consisting of flats between sandy ridges. In the flats the soil is a stiff black loam, evidently deposited by over-flows from the Torrens when in flood. It varies in depth from 2ft. to 6ft. over clay. The sand-ridges have several feet of sand over the local clay. Irrigation water is absorbed rapidly, and Colonel Rowell states that only on the rare occasions when the river floods have broken in has surface water remained unabsorbed for a few days. The land carries pears, figs, vines, apricots, peaches, and plums on the dark flat land, and almonds on the sandy rises. None of these trees have suffered from the effects of this water. Orange trees have not been a success, but the light soil and competition of other trees is probably the cause of their decline. Vegetables in season are grown for market. Cauliflowers, cabbages, lettuce, potatoes and carrots, red beet, turnips, onions, and other spring crops are successfully grown during the cool season. Trombones, melons, and tomatoes succeed well, but French beans are said to be very variable, some years succeeding and at others failing completely. Along the earthen furrows and slip-ways from the fluming, evidences of alkaline efflorescences—puffy soil or glistening particles are occasionally noticeable now (February)."

Here again, subsoil conditions would appear to suggest good natural drainage. It is probable that good winter rains help to sweeten the soil after summer irrigation. The failure of French beans and citrus trees is again significant.

Sample 3 (Mr. H. H. Lewis, Brighton).—Concerning this well and conditions surrounding it, Mr. Quinn reports as follows:—

"Well sunk in 1908. Depth of shaft 40ft., bore in bottom 20ft. Plantation served by it abuts on the road running from the Wheat-sheaf Hotel, Brighton, to Marion. Soil is stiff red loam, about 9in. to 12in. deep overlying a stiff light colored clay. This water has been used at moderate rates to scattered fruit trees and grape vines for a few seasons only. The owner has grown summer vegetables, such as trombones, tomatoes, and climber-beans for home consumption fairly successfully."

Data concerning this well are as yet too meagre for general conclusions. It is clear, however, from the results of the analysis that the permanency of satisfactory results is wholly dependent on local drainage conditions.

Sample 4 (Mr. F. Stanford, Fulham).—Mr. Quinn reports as follows on this well:—

"Well sunk in 1900. Depth of shaft 33ft. with smaller shaft 5ft. deep in bottom. Supply claimed to be 10,000galls. per hour. This garden lies on the immediate north bank of the Torrens, and with the exception of a sand mound occupied by the residence the surface is flat. Surface soil consists mainly of a dark sandy loam from 15in. to 24in. in depth, above a somewhat stiff clay. The soil, when moist, works beautifully, falling away freely from the plough. The clay beneath the deeper surface soils is apparently friable, as water does not lie long unabsorbed. The owner says, however, its absorbing powers are noticeably decreasing. The garden is devoted to vegetable-growing and is worked very intelligently. A small area of two-year-old oranges has been planted, and these are making good progress, but the owner proposes irrigating them from the river itself. In the cool season crops of cauliflowers, potatoes, lettuce, &c., are grown successfully, and summer crops such as trombones, melons, cucumbers, &c., are profitably produced. French beans do not thrive at all when irrigated from this well. On the sandy rise the house-garden has a few apples, pears, fig, orange, lemon, peach, apricot, and nectarine trees, which have grown unimpaired by applications of this water for a period of 14 years."

Here again we may note the failure of French beans, and doubts as to the success of citrus trees. It is possible, too, that the local drainage conditions may not be as good as surface indications would appear to indicate.

Sample 5 (Mr. A. R. Smith, Findon).—This property is within a mile and a half from that of Mr. Stanford. Mr. Quinn's report is as follows:—

"Well sunk in 1902 and used every year since. Depth of shaft 35ft. Depth of bore in bottom 15ft. Supply stated to reach 14,000galls. per hour. This garden is a flat area, consisting of a heavy black loam about 4ft. in depth. Overlying a dark sandy clay. It evidently consists of the deposits of light particles of flood-borne material from the Torrens. Irrigation waters soak away very rapidly in this soil, and water conveyed into trenches 4ft. apart will percolate laterally and soak intervening soil banks. This method, the owner states, alone proves successful when French beans are grown in this garden. The fruit grown have been peaches and apricots, which are failing in their ninth year. This may possibly be due to over irrigation, since summer vegetables are constantly grown between them. Orange trees, nine years old, and not inter-planted with vegetable crops are still in healthy, productive condition. These are surface flooded in check-banks, receiving heavy soakings at fairly long intervals. Vegetables grown here consist of cauliflowers, lettuce, onions, &c., during the cool season, and, in the summer, of tomatoes, trombones, and cucumbers. French beans do not thrive when irrigation water comes in contact with the plants above ground."

Here, again, French beans fail except under special treatment. Citrus trees, on the other hand, do not appear to suffer from the water. This is clear indication that present drainage conditions are satisfactory and that winter rains suffice for removing surplus salt left from summer irrigation.

CLASS B. (65 to 82 grains of injurious salts to the gallon).

All these waters are well stocked with lime, but carry no gypsum. Magnesium carbonate is also present in all of them. The chief injurious salt is overwhelmingly common salt, which varies from 44 to 60 grains to the gallon, out of an aggregate of 65 to 82. Magnesium chloride is present in three of the samples. Magnesium sulphate in all of them, and sodium sulphate in one.

Sample 6 (Mr. J. Bradbrook, Athelstone, South Well).—It should be recalled that an earlier well on Mr. Bradbrook's property has been recorded as sample 1. Mr. Quinn's report is as follows:—

"Well sunk over 20 years ago. Depth of shaft 70ft., three drives and bore of depth unknown to present owner. Yields about 5,000galls. per hour if worked eight hours a day only. This water is used on a piece of semi-alluvial sandy loam in a gully. It has been cleaned out and used for the past four years by the present and previous occupiers. All kinds of vegetables, including French beans, have been grown successfully. I saw it being used on tender dwarf beans with apparently good results. The occupier considers the water to be of better quality than from the old well (sample 1), but the output is less abundant."

A comparison of the figures of the analysis—136.8 grains to the gallon of injurious salts for the old well and 82.3 only for the south well, amply supports the occupier's view as to the relative value of the two waters. Given satisfactory drainage conditions there is no reason to believe that this water will ever give rise to irrigation troubles. We may notice for the first time that French beans can be grown successfully.

Sample 7 (Mr. J. B. Henderson, Campbelltown)—Mr. Quinn's report is as follows:—

"Well sunk in 1902. Depth of shaft 50ft. Supply about 2,000galls. per hour. The soil is a stiff chocolate clay loam overlying gravelly clay. The surface soil varies from 12in. to 15in. deep. This land becomes caked and hard unless carefully worked. The present owner states that he has been in the garden about nine seasons, and has grown cabbages, cauliflower, lettuce, onions, and other winter vegetables on a small scale, and has lately taken to producing tomatoes, French beans, and melons for market purposes. The water has been in use longer on citrus trees and a few stone fruit trees. The citrus trees are of varying ages, some being very old; they are not looking in first-class order, but it is possible improper treatment and unsuitable soil have much to do with this."

There are not much data to go on with here. It would appear to be difficult soil to handle, although the gravelly nature of the subsoil would suggest good under drainage conditions. We may note that French beans do not fail. Water from this well offers one peculiar feature, namely, 10.8 grains of nitrate of soda to the gallon. This may possibly be due to sewage contamination. In the meanwhile, it may be noted that an acre foot of water will bring to the soil the equivalent of about 4cwt.s. of nitrate of soda to the acre. It is possible that ultimately this water may affect adversely the general mechanical condition of this stiff land.

Sample 8 (Mr. J. B. Pierson, Hectorville)—Mr. Quinn reports as follows:—

"Well sunk in 1908. Depth of shaft 70ft., bore in same 50ft. Supply about 3,000galls. per hour. Soil consists of red clayish loam which predominates over the plains of Adelaide. Twelve inches of surface loam overlies a fairly friable red clay, with a sprinkling of water-worn sandstone and shale. This gives to the subsoil requisite porosity for getting rid of surplus irrigation waters. The owner grows winter vegetables successfully and in summer, under irrigation, French beans, cucumbers, and other melons. He waters in furrows and incorporates loose stable manure freely into his ground. The place is full of orange and lemon trees, 17 years old, and all in thriving condition; peaches, apricots, and grapes are also grown successfully."

Here we have good natural drainage and successful growth of all usual cultivated plants. No doubt the winter rains help to maintain the land sweet.

Sample 9 (Messrs. E. C. Short and Sons, Paradise).—Mr. Quinn reports as follows:—

"Well sunk in 1910. Depth of shaft 100ft., and bore inserted (1913) 50ft. deep. Supply about 2,500galls. per hour. The orchard is situated on the north bank of the Torrens. It consists chiefly of an alluvial deposit overlying and intermixed with water-worn gravel in that portion which adjoins the river bank; towards the rising ground, however, at a short distance from the foothill, is to be found a bar with 4ft. of soil overlying a hard clay subsoil. Generally speaking, in local circles this garden land is looked upon as ideal citrus soil and the fine growth of the trees supports this contention. The owners informed me that the water found in the shaft was of inferior quality prior to the insertion of the bore in 1913. The owners have used this water each summer since 1913 on citrus trees and stone fruit. It is pumped along furrows and rings, and it quickly disappears in the soil, which appears to drain perfectly."

Clearly, no trouble need be anticipated here.

Sample 10 (Mr. G. Weston, Marion).—Mr. Quinn reports as follows:—

"Well sunk 1912—shed well. Shaft 60ft., bore 90ft. (water supply chiefly from bore). Capacity 9,000galls. per hour. Plantation comparatively flat, adjoins Marion road. Occasionally flooded in winter when sluice gates admitting flood-waters from a creek from Eden Hills are opened. Soil varies from stiff reddish clay loam, about 9in. deep, overlying a deep layer of fairly stiff clay to a freer type of dark sandy loam overlying a gravelly clay. The latter type represents the land formerly flooded by the creek previously referred to, receiving gravel deposits and lighter silt from time to time; and thus laying down a drainage bed and building up and deepening the surface soil above it. Water from this well has been used every summer on grape vines, peaches, apricots, plums and almonds. The owner states that four waterings were usually given, each season, and the areas between the trees and vines were flooded in furrows and basins. The water soaks away in two or three hours. The stiffer land does not absorb the water quite so readily. No ill effects have been noted from the use of this water. Mr. Weston states that he has grown French beans successfully."

There is apparently no reason for apprehension here.

CLASS C.—20 grains to 40 grains of harmful salts to the gallon).

All these waters are stocked with lime, and the main injurious salt is common salt, present in relatively low proportions.

Since waters from all four wells are obviously safe for irrigation purposes, it seems unnecessary to refer to them individually of further length. With reference to sample 13 (Mr. F. T. Pitt, East Marden), Mr. Quinn points out that citrus trees have died back. It seems probable, however, that this must be attributable to unsuitable soil conditions rather than to the quality of the water, which shows no more than 23grs. to the gallon of injurious salts.

GENERAL CONCLUSIONS.

From the above data the following conclusions appear permissible:—

1. Under Adelaide conditions, *i.e.*, with winter and spring rains aggregating 14in. to 15in. irrigation water going up to 140grs. of injurious salts to the gallon may be used for fruit trees and vegetables, with the exception of citrus trees and French beans, providing natural drainage conditions are satisfactory.

2. Under similar conditions, citrus trees and French beans may safely be grown with water going 75grs. to 80grs. of injurious salts to the gallon.

3. Irrigation waters going over 140grs. of harmful salts to the gallon have not come under review. Judging, however, from the experience of older countries situated in the arid regions of the globe, it seems probable that around Adelaide even 200grs. to the gallon will not prove disastrous to plants, other than citrus trees and French beans, providing drainage conditions are perfect.

4. It should be stated that it is a fact of common experience in other countries that given satisfactory drainage, irrigation water highly charged with saline matter should be used freely rather than sparsely. Small quantities of water lead to rapid concentration of salts under the influence of surface evaporation, whereas, an abundance of water tends to retain soil moisture at the requisite degree of dilution.

5. Finally, it is clear that relatively highly saline irrigation water can be used in summer with greater safety in those localities where winter rains are heavy than in those in which they are normally light. Similarly, the presence in the soil of a high proportion of injurious saline material adds to the danger of using for irrigation purposes waters highly charged with harmful salts.

RIVER MURRAY HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR OCTOBER, 1923.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.		Butterfat.	
			Per Herd during October.	Per Cow during October.	Per Herd during October.	Per Cow during October.
1/C.....	32	26.77	28,626.5	894.58	1,122.89	35.09
1/J.....	21	17.10	12,846.5	611.74	586.03	27.91
1/L.....	19	17.97	14,935.5	786.08	655.57	34.50
1/M.....	21	13.48	7,420	333.33	399.44	19.02
1/R.....	17	15.16	10,316	606.82	471.23	27.72
1/T.....	13.68	11.35	7,737.5	565.60	416.40	30.44
1/W.....	18	15.55	11,193	621.83	436.85	24.27
1/X.....	18	14	13,252.5	736.25	560.60	31.14
1/Y.....	20.77	19.16	14,809.5	713.02	686.55	33.05
1/Z.....	21	17.42	14,393	685.38	658.71	31.37
1/AA.....	7	4.84	4,925	703.57	232.40	33.20
1/CC.....	19.13	19.06	11,539.5	603.21	494.24	27.84
1/LL.....	9	9	5,332	592.44	262.19	29.13
1/EE.....	10	8	6,153.5	615.35	292.11	29.21
1/FF.....	12	12	9,594.5	799.54	410.60	34.22
1/GG.....	8	7.03	5,634.5	704.31	266.97	33.37
1/HH.....	13	9.48	7,625.5	586.57	321.13	24.70
1/II.....	13	12.06	8,629.5	663.81	355.47	27.34
1/JJ.....	15	9.58	7,157	477.13	310.69	20.71
1/KK.....	14	8	5,967.5	426.25	278.17	19.57
1/DD.....	20	18.90	13,667	683.35	607.29	30.36
1/MM.....	16	15.19	9,420.5	588.78	431.29	26.96
MEANS.....	16.25	13.69	10,508	646.50	466.22	28.68

RINDERPEST OR CATTLE PLAGUE.

The seriousness of an outbreak of Rinderpest, previously unknown among cattle in Australia, cannot be over estimated on account of the rapidity of its spread, the heavy mortality, and the consequent expense involved in adopting combative measures to control and suppress it. Something of the latter phase may be gleaned from the knowledge that in 1865 an outbreak extending over a period of three years, cost the British Government something like £5,000,000 in order to suppress it.

In addition to the cost of administrative and executive measures needed in its overthrow, there is also the fact that the knowledge of its presence in our herds might have a very serious prejudicial effect on our export trade in the future.

The natural series of questions occurring to the average man are:—

- (1) What is Rinderpest?
- (2) What animals are affected?
- (3) What is the mortality?
- (4) What are the lesions?
- (5) How is it diagnosed?
- (6) What treatment if any?
- (7) What protective measures are adopted by the Commonwealth and State authorities to prevent its appearance here?

The answers to the above questions supplied by the Stock Department are as follows:—

(1) This is an acute infectious disease of cattle, readily transmissible from one to the other. It usually takes a fatal course and the period of incubation varies from three to nine days.

The original home of Rinderpest has been the subject of authoritative dispute, some consider it the territory surrounding the Black Sea and the Volga river in Russia, others Central Asia. From here it has spread to nearly every country in Europe and Asia, where it has proved a scourge. At present it prevails in Russia, India, South Africa, and the Philippines.

The cause is probably one of bacterial origin and the contagion is conveyed by virus. This may be transmitted from one sick animal to a healthy one by various means, such as excreta, discharge from nostrils, saliva, urine of the diseased. It may retain its vitality outside the body for an indefinite period, and it is on record that an outbreak occurred as a result of feeding hay soiled with discharges from an infected animal twelve months previously. Manure, fodder, and bedding, soiled with discharges may convey it; persons may carry the virus on their clothes or boots. Ships conveying fodder, bones, &c., may be the means of carrying the disease from country to country or State to State.

(2) Cattle are the animals principally affected, but all large ruminants may become affected, *i.e.*, buffaloes, reindeer, and large antelopes. The small antelope escapes. Sheep and goats are susceptible, but only in a less degree.

(3) In a country previously free from this disease, the death rate is about 90 per cent. In country which has previously been invaded, the death rate is about 45 per cent.

(4) No definite lesions are noted if the animal is slaughtered in the early stages of the disease, only the blood being affected. Later stages show the fourth stomach to be affected with a claret colored ulceration. This claret colored ulceration is also found in the bowels and arranged in longitudinal folds. These lesions are covered with diphtheritic exudate. Lesions may be found in the nostrils, mouth, pharynx, stomach and bowels; the vagina and rectum are always affected; the gall bladder is also involved.

DIAGNOSIS.

(5) The best time to examine animals suspected is at sunrise, after a cold night. This fact was well known to the Boers in South Africa. The necessity for this is due to the fact that sunshine masks somewhat the earlier symptoms. The first sign is a rising temperature. After 24 hours there is noticed a dribbling of tears from the eyes, followed by a spasm of the eye lids, irritation of the mouth, and dripping of saliva. Facial muscles are contracted in a painful manner. diarrhoea gets worse, gradually becoming mixed with mucus, then blood. An offensive odor is a characteristic of this stage of the disease. The animal gets weaker, muscles get flaccid, the skin lusterless and dry, becomes wrinkled and cold, and the ears and head, droop from weakness. One may occasionally meet with a typical case in which no diarrhoea is present, *i.e.*, old oxen or bull.

TREATMENT.

(6) The only effective method of exterminating the disease in a previously clean country is by limiting the movement of all stock within a given zone, and by the slaughter of all affected animals and exposed animals. If the disease occurs in a country previously visited by the disease, successful results may follow a system of immunization, by inoculation of exposed animals. This immunity may be obtained by (1), inoculation of bile from an animal which has recently died of Rinderpest; (2), Inoculation of glycerinated bile or virulent blood; (3) By simultaneous methods of inoculation of a strong standardised serum and virulent blood.

PROTECTIVE LEGISLATION.

(7) This will be found provided for in Quarantine Regulations 1922, part 3, (providing for the quarantine of vessels, persons and goods) together with part 6, which provides for the quarantine of animals from Ports external to the Commonwealth. By the above ample protective machinery is provided by the Commonwealth against the importation of animal disease, either in the form of diseased animals or *via* medium of material such as fodder, fittings, or any material

capable of acting as a medium for the conveyance of disease. In addition to the above no cattle are imported from Russia, India, South Africa, or the Phillipines. Animals that are imported from the United Kingdom and Ireland, Canada, United States of America, and New Zealand are admitted only on the production of the necessary declarations and certificates, notices and permits issued by authorised quarantine officials at the port of shipment. In addition all animals are inspected and examined on arrival by a Government Veterinary Officer, afterwards they are compelled to undergo an adequate period of quarantine during which they are subjected to certain prescribed tests of health as set out under Quarantine Regulations.

Animals imported from other States must be accompanied by the owner's Declaration of Health and countersigned by an authorised Inspector of the Stock Department of that State.

In addition to the above there is a system of weekly notification from one State to another of any outbreak of disease having taken place. This notice indicates the district and nature of the disease.

The Stock Diseases Act provides that the owner of any stock suspected of being affected with any infectious or contagious disease shall report same to the Stock and Brands Department, also the nearest Inspector of Stock within 24 hours. The penalty for breach of notification is a fine of not exceeding £20 per day for each and every day on which an owner neglects or omits to perform his duty.

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January and July, 1921.

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FARMERS' DAY AT KYBYBOLITE.

One hundred and twenty delegates representing the Mount Gambier, Kalangadoo, Penola, Mundulla, Naracoorte, Kybybolite, Frances, Glen-coe, and Moorook Branches of the Agricultural Bureau, and in addition a number of ladies, including representatives of the Kalangadoo Women's Branch of the Bureau, visited the Government Experimental Farm, Kybybolite, on November 28th. The party, reinforced by representatives of the Department of Agriculture, including the Director of Agriculture (Professor Arthur J. Perkins), the Assistant Dairy Expert (Mr. H. J. Apps), Mr. C. J. Tuckwell (Member of the Advisory Board), Field Officer for the South-East (Mr. E. S. Alcock), and the Secretary, Advisory Board of Agriculture (Mr. H. J. Finnis), and under the guidance of the Farm Manager (Mr. L. J. Cook), made a tour of inspection of the Institution. Pamphlets containing details of the cropping, particulars of results secured during recent years, and plans of the different fields, aided visitors in securing an insight into the operations of the farm.

MORNING INSPECTION.

After having assembled at the Homestead, the party first paid a visit to the Farm Orchard of about 10 acres, which is under the care of Mr. S. C. Billinghurst. From this point the party journeyed to the Irrigation Plots which were carrying six varieties of maize for grain. Hunter river lucerne, 11 varieties of sorghum, sudan grass, four varieties of sunflowers, and three varieties of mangels. Water used on these plots is lifted by a 4in. centrifugal pump, delivering 12,000gall.s. per hour, from a 40ft. well. At the time of the visit water was being distributed by means of the open furrow system. A series of plots designed to test a six-course rotation next came under observation. The rotation consisted of wheat, hay, turnips, barley, and two year's pasture (Italian rye-grass and Alsike clover). A very fair stand of Alsike clover and Italian rye-grass was to be seen on field 9F and the barley in 9E promised a good yield. In field 15 a collection of oat varieties was growing, an outstanding feature being the appearance of the Early Burt and Algerian varieties. Field 16 was under summer crops (maize, sorghum, and sunflowers) without irrigation. They had all germinated well and made a good start.

AFTERNOON INSPECTION.

After an adjournment for luncheon, the first fields inspected were Nos. 4A to 4D, which were carrying plots testing the Norfolk rotation, *i.e.*, wheat, turnips, oats, peas. This rotation has now been under test for five years. The plots gave indications of some very promising yields, especially of peas and oats. Alongside these fields, a six-course rotation in fields Nos. 6A to 6F was under test. This rotation consisted of peas, wheat, turnips, barley, crimson clover, and oaten hay. A very good stand of crimson clover was noticed in 6A and the wheat crop in 6D and barley in 6F were very promising. From this point the

party journeyed to the Pasture Improvement tests which attracted considerable interest. Plots in field No. 7 were visited first. These consisted of areas designed to show the improvement to natural pasture without cultivation as a result of the treatment with various phosphatic fertilisers. The tests have been in progress for five years, and plot No. 3, which has now received a dressing of 1 ton of lime and 5ewts. superphosphate during that period, showed a remarkable growth of naturalised grasses, the principal of which were Hop clover and trefoil, and barley and wallaby grasses. Field No. 13, consisting of land previously under cultivation, was this year divided into plots, and on July 1st was top-dressed with various phosphates with the object of testing tetraphosphate against lime and superphosphate. A marked improvement was noticed on all the dressed plots, but No. 5, which received 5ewts. super per acre, showing a thicker mat of growth, especially of naturalised clovers, than the other plots.

Fields No. 20A and 20E which have been ridge ploughed in seventeen 6in. ridges for some years were under crop this year. One was sown to three varieties of wheats (White Essex, Leak's Rust-proof, and Queen Fan), which promised good average yields, and the other to oats and Subterranean clover, the clover being seeded at the rate of 4lbs. per acre, broadcasted after the field had been drilled with oats and 2ewts. of super per acre. The growth of this clover was very pleasing, there being a thick mat practically covering all parts of the field that had not been actually under water for about four months of the winter. This field should give an abundance of stubble feed.

THE LIVESTOCK.

The stock, which consisted of 35 horses, about 70 head of Ayrshire and grade Ayrshire cattle, 114 pigs (including 20 pedigree Middle Yorkshire sows), and 550 sheep (including 40 English Leicester stud ewes and grade Leicester crossbreds) were in particularly good condition generally. The cattle and pigs came in for considerable admiration. The recently imported bull "Ida's Laird of Gowrie Park" was the centre of no little attention. This animal was bred by Mr. W. P. Brisbane, of Camperdown, Victoria. It was 14 months old and gave every appearance of developing into an exceptionally fine type of the breed. During the past 12 months the herd sire has been "Loyalty of Bridge View." This animal was also generally admired; it was bred at Gawler by Mr. R. J. Clements, and is the progeny of a cow which won the Championship of the breed at the last Royal Agricultural and Horticultural Society, Adelaide.

During the luncheon adjournment, Representative Cameron, M.H.R., proposed a vote of thanks to the Staff of the Department and to the Government for affording the opportunity for visitors to inspect the farm. This was seconded by Mr. A. A. Sasanowsky, and supported by Messrs. J. C. Brown (Frances); W. Clifford (Penola); A. Ferguson (Glenoe); G. Shepherd (Kybybolite); J. L. Heaver (Moorak); W. Loller (Naracoorte); and a representative of the Mundalla Branch, Professor Perkins and Mr. C. J. Tuckwell acknowledged the vote of thanks.

DEPARTMENT OF AGRICULTURE, SOUTH AUSTRALIA.

OFFICIAL STUD CATTLE TESTING.

The following are the rules governing the *Official Testing of Pure-Bred Stud Cattle for Production*:—

1. The official year shall commence July 1st, and end June 30th.
2. The testing shall be performed by qualified Departmental Officers.

Cows Eligible for Testing.

3. Only those cows and heifers which are registered, or have been accepted for registration in a recognised Herd Book or Pure Stock Register, will be accepted for test.

4. If a breeder owns more than one herd upon separate farms, each herd shall be considered and recorded as a separate herd.

Proportion of Herd which must be Tested.

5. All herd book cows in a stud herd which has been submitted for testing shall be tested annually unless exempted by the Minister of Agriculture on written application from the owner stating exceptional circumstances, and indorsed by the Director of Agriculture; but in no case shall more than 50 per cent. of the females in lactation during each year be so exempted; and further, all cows must be completely tested at least once before reaching the age of four (4) years and at least once again before reaching eight (8) years of age.

Exemptions from Testing.

6. Exemptions from the test may be granted in respect of cows.
 - (a) over ten (10) years of age and those that are sick, diseased, or injured.
 - (b) any cow that aborts during her lactation period shall forthwith be drawn from test.

Branding for Identification.

7. Every cow or heifer entered for test, and every calf, the progeny of such cow or heifer must be branded to the satisfaction of the Department of Agriculture in such a manner as to ensure identification.

Fees for Testing.

8. Each owner shall pay to the Department of Agriculture on entry of his herd and annually thereafter, at the commencement of each Official testing year, a herd entry-fee of Three Guineas. There shall also be paid in advance an amount of Ten Shillings testing fee for each lactation period of each animal submitted for test. The minimum total amount of herd entry fee plus testing fee which shall be paid per herd on account of an official year shall be Five Pounds (£5).

Good Words all Over the Country

For this latest

HUPMOBILE.

Everywhere it is fulfilling all our promises of still finer performance and higher value than even the HUPMOBILE had ever afforded.

It is longer and larger and more beautiful, and more comfortable to ride in.

But it is in the things that stir a man's blood—the smooth, swift start, the quick settling down to steady going, the feel of increased power and speed, that the new HUPMOBILE unquestionably dominates its field.

WE'LL GLADLY SUPPLY FURTHER PARTICULARS.

Phoenix Motor Co. Ltd.,

112-120, Pirie Street - - - - - Adelaide.

When Official Test Commences.

9. The official lactation period shall commence five days after calving. The first five days' yield shall not be included in the testing period.

Duration of Official Test.

10. The official lactation period shall be 273 days, which may be extended to 365 days at the request of the owner, but such request must be submitted to the Director of Agriculture not later than one month prior to the expiration of the 273 days.

Method of Calculating Records.

11. The yields for the Official Record shall be calculated as follows:—

- (a) The lactation period shall consist in the case of the 273 days' record of nine (9) sub-periods, covering respectively eight (8) sub-periods of thirty (30) days and one (1) of 33 days; and in the case of 365 days' record of eleven (11) sub-periods of 30 days and one (1) of 35 days.
- (b) The cows shall be tested once in each sub-period at approximately equal intervals of time.
- (c) The official yield shall be the sum of the yields of each sub-period.
- (d) The yield for each sub-period shall be calculated as follows:—
The milk yield shall be the amount produced over 24 hours multiplied by the length of the sub-period. The butterfat yield shall be determined by multiplying the number of days in the sub-period by the sum of individual totals obtained from separate tests of each milking during the 24 hours.

Method of Taking Samples.

12. The Official Tester shall satisfy himself that all cows are stripped out at the milking prior to the commencing of the 24 hour Official Test.

13. The Official Tester shall weigh on approved scales during each milking the milk of all animals under test and shall record such weights on printed charts prepared for the purpose by the Department. A sample from each milking shall be taken by the Official Tester, after he has properly mixed the milk from bucket to bucket at least three (3) times.

- (a) No milk weight shall be credited to any cow unless the aggregate of all milkings in the 24 hours totals four (4) lbs. or over.

Testing at Irregular Intervals.

14. In the event of it not being possible to make a test immediately after an interval of 30 days, the test may be taken not more than 35 days or less than 25 days after the preceding test; and if this is not

practicable the calculations for the sub-period concerned shall be obtained by averaging as in the case of an abnormal test (*vide* rule 15), except that in addition to the tests of the preceding and succeeding months, the weights and tests (if any) of the sub-period under review will also be included in making the average.

Averaging Abnormal Tests.

15. If the Official Tester is of opinion that any individual test is abnormal, he will not register it, but will make a special visit to the dairy and weigh and test another sample of milk. If this cannot be arranged, he will register a test obtained by averaging those of the nearest two (2) sub-periods.

Cows Not Tested Until Two Months After Calving.

16. When it is found impracticable to make the first test during the first 60 days of a lactation period, the Department may (upon receiving a Statutory Declaration from the owner, or other acceptable proof as to the date of calving) credit yields for such 60 days based on the official test registered for the third sub-period.

In every instance of the first test not being made during the first sub-period, the Official Tester shall report in writing to the Department the reasons for such delay.

Certificate and Butterfat Standards.

17. (a) All calculations shall be made and recorded and published in terms of pounds of milk and butterfat only.

(b) The Chief Clerk of the Department of Agriculture shall be the Official Recorder and shall sign all certificates.

(c) The Department of Agriculture shall issue certificates showing the records of each pure-bred cow that attains or exceeds the Official standards as set out hereunder:—

Junior 2 years old	200 lbs. Butterfat
Senior 2 " "	225 " "
Junior 3 " "	250 " "
Senior 3 " "	275 " "
Junior 4 " "	300 " "
Senior 4 " "	325 " "
Mature cows	350 " "

In the above standards a Junior animal in each class is one which at date of calving has not attained to $2\frac{1}{2}$, $3\frac{1}{2}$, or $4\frac{1}{2}$ years respectively, and a Senior animal is one which at date of calving has attained or is over $2\frac{1}{2}$, $3\frac{1}{2}$, or $4\frac{1}{2}$, but less than 3, 4, or 5 years respectively.

Publications of Records.

18. Records of all cows submitted to the test, including those that fail to reach the Official standard, shall be published in the *Journal of Agriculture*.

Particulars of Dates of Calving; Foodstuffs, &c.

19. (a) Particulars as to dates of service and calving shall be supplied to the Official Tester.

(b) Owners must supply on the request of the Department of Agriculture, a declaration as to the class, quantity, or any other details regarding the rations fed during the period covering the test; and when deemed necessary by the Department, permit samples of the different foods to be taken for analysis.

(c) All particulars required by the Department shall be made by sworn declaration when deemed advisable.

20. The feeding of whole milk or cream to cows under test is prohibited and records from cows so fed shall be disallowed.

21. Owners of herds must afford every facility to enable the Official Tester to carry out his duties, and must provide him with accommodation over night when necessary.

Owners to Supply Testing Equipment.

22. When necessary, each owner may be required to provide and keep on his premises a Babcock Testing Machine and equipment to suit the requirements of the Department of Agriculture.

Disqualifications.

23. Should the owner of any herd entered for testing not conform to these regulations, such herd shall be subject to disqualification for such period as the Minister of Agriculture may determine.

Testing Other Than Herd Book Animals.

24. Cross-breds, grades, and unregistered pure-breds, the property of owners submitting herd book cattle, may be tested by the Official Tester, provided he is not unduly detained thereby; but certificates showing production of such cows will not be issued. The testing fees shall be governed by Clause 8 hereof.

The Legal Aspect.

25. No person who has submitted any herd, cow, or heifer for testing, or for whom any herd, cow, or heifer is at any time tested by the Department, or by any of its officers or servants, shall have any claim for damages, whether arising out of breach of contract, tort, or otherwise howsoever, against His Majesty the King, the Government, or any person in the service or employment of his said Majesty or the said Government, for or in respect of anything done, or omitted to be done, under or in connection with these rules, or the performance, or non-performance, of any act or duty thereunder, or in carrying out or in attempting to carry out the testing of any herd, cow, or heifer, or for anything done or omitted in reference thereto, or in connection therewith.

NOTES FROM GOVERNMENT ORCHARD, BLACKWOOD.

[By RODNEY FOWLER, Manager.]

Weather conditions during the month have been more settled and trees in bloom have had a much more favorable chance of setting crops of fruit. Rain fell on only seven days, principally only in light showers, the maximum fall being 55 points on the 17th, which proved a very useful rain from a cultivation point of view. The mean shade soil temperatures have remained fairly even, though once or twice great variations occurred in the shade temperatures. Though apples in most instances bloomed well the setting is again somewhat disappointing in commercial varieties, with the exception perhaps of Jonathans; Cleopatras, Dunn's, and Rome Beauty have set only moderate crops.

Cherries are now coming in, but the bird pests—starlings and black-birds—are taking a heavy toll. These pests seem to be getting worse each year. The cherries ripen just at the time the young birds are in the nests and it is quite a common sight to see a parent bird flying off with a cherry in its beak on which to feed the young, thus predisposing each succeeding generation to a fruit diet. It would be interesting to know if this habit is long continued what the ultimate result will be. Will what is naturally an insectivorous bird become altogether a fruit-eating one?

CHERRY STOCKS.

The question of cherry stocks is one which at the present time is causing some inquiry in the other States as the cherry-growing industry is said to be languishing for want of some solution of the problem. An interesting series of stock tests in connection with the cherry have been running in this orchard for some years and data in connection therewith are now being prepared for publication by the Horticultural Instructor. It is interesting to note in the orchard collection of some 200 varieties all worked on Mazzard stocks, the difference in vigor and bearing habits of the different varieties: some instructive information may be collected from this source.

STRAWBERRIES.

Strawberries have been fruiting during the month, and the present cool conditions are favorable to a continuance of the crop, as plenty of bloom and berries are still showing. Varieties showing most promise are Gandy, Ettersburg 98, Ettersburg, Paxton, Leura, and Dr. Moore. Ettersburg has carried an enormous number of berries, but they have developed into somewhat small fruits. Demand has been good and prices favorable to the grower. Where possible the strawberry beds should be kept moist and free from weeds. A little liquid manure in the form of sulphate of ammonia, (1oz. to 4galls. of water) applied after watering will help the plants along wonderfully. All

runners should be suppressed if it is desired to get a second crop. They can be forced along later in the season if new plants are wanted.

CURL LEAF.

In previous notes reference was made to some spraying tests with various preparations for the control of curl leaf in peaches. During the month the effects have been very noticeable, and confirmed my previous statements that for efficiency and cheapness there is nothing to beat the recognised Bordeaux or Burgundy mixtures made from the formula recommended by the Horticultural Branch of the Department of Agriculture.

COMBINED SPRAYS.

As doubts are sometimes expressed by growers as to whether injury will result when lime sulphur and arsenate of lead are used as a combined spray, tests were made during the month and the results go to show that when carefully mixed, lime sulphur 1 in 70, with arsenate of lead added just before using is a perfectly safe spray to apply, no injury resulting to foliage or fruit. Burgundy, with arsenate of lead, has also been reported as dangerous, owing to liability of injury to the young fruits, but from tests made during the month there appears to be no justification for supposing that this spray will cause the young fruits to fall off.

RED SPIDER.

Growers sometimes ask if lime sulphur applied to plum trees at this time for bryobia mites (sometimes called red spider) will injure the trees or crops. This also has been tested and again the results go to show that lime sulphur 1 in 70 is a perfectly safe spray to apply and also very efficient in combating mites. This has been demonstrated on almonds in the Hackney orchard and the almonds there are now regularly sprayed with lime sulphur spray. These sprayings were applied during a hot spell with temperatures nearing 100° Fahr. in the shade.

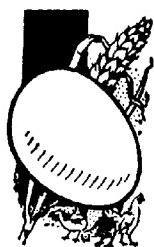
WOOLLY APHIS.

Applications of salt in strengths varying from 4lbs. to 14lbs. per tree were given to apple trees affected with woolly aphid (this having been reported as being an effective treatment for trees so affected), but it is too early yet to say anything definite. So far the treatment has not had any effect. During the month spraying with Black Leaf 40 (nicotine sulphate) has been carried out against this pest, a motor pump and spray pistol being used, and I have no hesitation in saying that this is the most effective weapon I have ever used against woolly aphid. The ease with which it can be manipulated and the force with which the spray can be concentrated on any particular spot makes it an invaluable weapon in the fight with woolly aphid. The difficulty has always been effectively to get at the insects owing to their natural protection, but the spray pistol has overcome that difficulty.

CODLIN MOTH.

Early in the month the first codlin moth on the wing was observed and numbers have since been killed in the fruit house, and this fact has rather important bearing on the question of spraying for this pest.

WHEN POULTRY KEEPING IS MOST PROFITABLE.



Taking it by and large, poultry keeping is a game of many ups and downs for the poultry keeper who takes no precaution to keep his hens laying consistently the whole year round. The profits made when eggs are plentiful very quickly diminish, when "Winter comes" and eggs are scarce. And yet, making sure of a good Winter egg supply involves only the expenditure of a ha penny a day for every 12 fowls and the very little effort involved in mixing

'KARSWOOD' POULTRY SPICE with the wet or dry mash. This is a fact well known to prominent breeders and to over half a million small poultry keepers throughout the World. 'KARSWOOD' supplies tonic ingredients and food properties which promote health and vigor in the birds, thus enabling

them to produce more eggs by natural means, and to effect a quick and thorough moult, and get down to the business of earning profits again without delay.

By starting 'KARSWOOD' feeding now, you are insuring your Winter profits, you are increasing the value of your birds, and you are making certain of fertile, hatchable eggs and healthy chicks when next the breeding season comes around.

Start this insurance today. Go to your local grocer, storekeeper, or produce dealer, get a 1s. packet and commence feeding to-morrow. If your local dealer cannot supply you, he can get supplies from the Agents named below.

NOTE THE ECONOMY.

One tablespoonful ($\frac{1}{2}$ oz.) of 'KARSWOOD' Poultry Spice (containing ground insects) is sufficient for 20 hens for one day. So that it costs you less than a $\frac{1}{2}$ d. a day for 12 birds.

1s. packet (1lb.) supplies 20 hens 18 days.
2s. packet (1lb.) supplies 20 hens 32 days.
12s. tin (7lbs.) supplies 140 hens 32 days.
14lbs. tins, 25s. 28lbs. tins 48s.

Makes 12 Hens Lay for $\frac{1}{2}$ d. a Day.

AGENTS FOR SOUTH AUSTRALIA—

S. C. EYLES & Co.,
CURRIE ST., ADELAIDE.

There has been an increasing tendency amongst growers to think that the calyx spray is unnecessary, as only a few of the insects are on the wing. If the fight against this pest is to be effective or a decent percentage of clean fruit harvested it is not safe to neglect this spraying, remembering that every grub allowed to escape at this time means many more to be killed later on. The apples and pears in this orchard have already—end of November—received two sprays with arsenate and a third spray will be started in a few days.

CURCULIO BEETLES.

It is possible that curculio beetles will make their appearance shortly. They come sometimes in great numbers and do a considerable amount of damage. Many methods of combating them have been tried but they are difficult to deal with. Arsenate of lead (1lb. powder in 8galls. water) is very effective when sprayed on cherry trees. They can be trapped in thousands in an oil trap placed round the butts of the trees. Where they appear steps should at once be taken to check them, otherwise they will certainly do a vast amount of damage, particularly to young trees.

CITRUS.

Citrus trees have bloomed well and are carrying a nice crop of fruits though of course there will be the usual falling off of small fruits, but it looks as though a good crop will mature. It is rather noticeable in places that the western side of the trees seems to have suffered some sort of set-back, due probably to cold winds or other unfavorable climatic conditions. At the present time in this orchard this condition is most noticeable.

BUDDING.

The season is now at hand when the operation of budding may be carried out. Undesirable varieties can be changed, and unprofitable trees made productive by this process, which is very simple and may be successfully undertaken by the amateur grower. There is in the Blackwood orchard a very large collection of varieties of all sorts of fruits, and bud wood from these is available to any grower so desiring, on payment of slight cost for packing and postage, usually about 1s.

FIG WASP.

The *Blastophagus* has been fairly active during the month, but the rather cold conditions and the absence of warm sunshine seems rather to have retarded its activities, and as a result large numbers of the spring crop of Capri figs are now falling to the ground, although a sufficient quantity remains to fertilise the coming crop of Smyrna figs. Any grower of Smyrna figs desirous of securing a small number of wasps can have same on applying direct to the Horticultural Branch of the Department, or by paying for packing and postage when thus dispatched. The summer broods are usually ready to issue from the Capri figs about the middle to third week of December.

ANALYSES OF SAMPLES OF ARSENATE OF LEAD.

The Horticultural Instructor (Mr. Geo. Quinn) reports that during September officers of the Horticultural Branch purchased from retailers in Adelaide, all the available brands of Arsenate of Lead as placed on the local market, in sealed packages. These were submitted to the Department of Chemistry for testing for chemical and physical properties. The results are given by the Director of Chemistry, and in the undermentioned tables purchasers may note the peculiarities of the various brands. Discussing these, Mr. Quinn remarks:—

It will be noted from the table showing the moisture free condition that in so far as their constituent parts are concerned, they present a very even quality—some possessing a slightly higher water soluble arsenic content, but from American standards, none should hold sufficient to cause injury to the foliage of the trees sprayed with same. The powers of holding in suspension in water vary vastly, some brands which stood high in the tests of previous years have dropped down the scale, and others formerly low in suspension indicate a desirable rise in this respect. It is a matter for regret that these tests could not be made and published at least two months earlier, but stocks of many of the lines are not procurable on the open market until immediately prior to the opening of the spraying season for codlin moth in October.

If the insecticides Act were put into force and a date fixed for the lodging of guarantees which would precede the opening of the spraying season, the growers could have this information prior to procuring their supplies for the year's operations.

REPORT BY THE DIRECTOR OF CHEMISTRY (DR. W. A. HARGREAVES).
Nine samples of arsenate of lead, received on October 1st, 1923, have been analysed with the following results:—

Analyses of the Samples as received.

No.	Brand.	Moisture.	Total	Total	Water
			Lead (PbO).	Arsenic (As ₂ O ₃).	Soluble Arsenic (As ₂ O ₃).
1.	Blyth's "Blue-Bell." Paste	44.8	35.2	18.2	0.23
2.	A. M. Bickford & Sons, Ltd. "Aero." Powder	0.50	65.0	30.8	0.17
3.	Vreeland Chemical Co. "Electro." Powder	0.25	63.5	31.9	0.17
4.	Vreeland Chemical Co. "Electro." Paste	1.5	62.2	32.1	0.19
5.	Bowker Insecticide Co. "Swift's." Paste	45.8	34.0	17.8	0.09
6.	Jacques Pty., Ltd. "Elephant." Paste	47.2	33.3	17.4	0.35
7.	Hemmingsway's London Purple Co., Ltd. "Hemmingsway's" Paste	36.7	40.0	21.2	0.26
8.	Sherwin & Williams. "Sherwin & Williams." Powder	0.14	64.0	32.9	0.29
9.	Kil-Tone Co. "Green Cross." Powder	0.18	65.9	39.6	0.29

Results Obtained on the Moisture Free Samples.

No.	Brand.	Total Lead (PbO).	Total Arsenic (As ₂ O ₃).	Water Solu. (As ₂ O ₃) _n .
		%	%	"
1. "Blue-Bell." Paste		63.8	33.0	0.42
2. "Aero." Powder		65.3	30.95	0.17
3. "Electro." Powder		63.65	32.0	0.17
4. "Electro." Paste		63.1	32.6	0.19
5. "Swift's." Paste		62.7	32.8	0.17
6. "Elephant." Paste		63.05	32.95	0.06
7. "Hemingway's." Paste		63.2	33.5	0.41
8. "Sherwin & Williams." Powder		64.1	32.95	0.29
9. "Green Cross." Powder		66.0	30.65	0.29

SUSPENSION TESTS.

The samples were mixed with water in the proportions recommended by the manufacturers for use in spraying trees to destroy codlin moth caterpillars. In cases in which the label specified a minimum and a maximum quantity, the mean of the two weights was taken for the test. The result of each suspension test is expressed as the percentage of dry weight of matter in suspension calculated on the dry weight of the sample, that is, the determination is made on the dry basis. The results obtained are given in the accompanying table.

Suspension Tests.

No.	Brand.	Mean Weight Recom- mended for 100galls.	Equiva- lent Weight of Dry Matter.	Percentage remain- ing in Suspension after Standing--		
				5 Min.	15 Min.	30 Min.
1. Blyth's "Blue-Bell." Paste		5	2,760	78.1	62.7	60.3
2. A. M. Bickford & Sons, Ltd. "Aero."	Powder	3	2,985	23.4	16.4	6.9
3. Vreeland Chemical Co. "Electro." Powder		2	1,995	26.3	13.2	10.8
4. Vreeland Chemical Co. "Electro." Paste		4½	4,432	13.0	6.0	3.2
5. Bowker Insecticide Co. "Swift's." Paste		4	2,168	48.0	20.5	13.1
6. Jacques Pty., Ltd. "Elephant." Paste...		5	2,640	82.2	68.8	50.4
7. Hemingway's London Purple Co., Ltd. "Hemingway's." Paste		6	3,798	13.1	8.1	5.2
8. Sherwin & Williams. "Sherwin & Williams."	Powder	2	1,907	28.2	18.8	9.8
9. Kit-Tone Co. "Green Cross." Powder...		2	1,996	32.1	18.0	7.4

Sample No. 4. Vreeland Chemical Co., "Electro" Paste.—This sample was in an original container but it had dried out in the jar until it had become almost air dry.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, November 21st, at the Agricultural College, Roseworthy. There were present—Mr. W. S. Kelly, Capt. S. A. White, Professor A. J. Perkins, Messrs. C. J. Tuckwell, A. M. Dawkins, W. J. Colebatch, B.Sc. (Agric.) M.R.C.V.S., Colonel J. Rowell, C.B., and the Secretary (Mr. H. J. Finnis).

Inspection.—Under the guidance of the Principal of the College Mr. W. J. Colebatch, B.Sc. (Agric.) M.R.C.V.S., members of the Board made a tour of inspection of the College cropping during the morning. In the afternoon the farmstead and stock came under observation.

Mallee Lands Instructor.—Further consideration was given to the resolution from Congress, urging that the position of the Mallee Lands Instructor should be filled. It was decided to make strong representation to the Hon. Minister of Agriculture to this effect.

Bird Destruction.—A communication was received from Mr. J. F. White of Macclesfield, requesting suggestions for controlling Bird Pests in Orchard Lands. It was decided that Capt. White should visit the locality in question and confer with the inquirer.

Life Membership.—The honor of life membership of the Agricultural Bureau was conferred on Messrs. S. Pratt of the Hartley Branch and A. Phelps of the Clarendon Branch, both of whom had completed 20 years' service as members of the Agricultural Bureau.

New Branch.—Approval was given to the formation of a Branch of the Agricultural Bureau at Kringin, with the following gentlemen as Foundation Members:—A. P. and W. Baldwin, P. and F. W. Morrow, J. Mathew, H. Lockhurst, W. Cornell, G. Guthleben, H. H. Menz, V. R. and F. C. Tee.

New Members.—New members were appointed as follows:—Loxton J. G. Pfeifer, A. Hanke, B. Hanke, J. A. Seidel, C. A. Kaesler, J. P. Handtke; Moonta—A. Marsland; Rendlesham—F. V. Burchell, J. D. Moody; Paruna—E. Altman, E. Groom; Wirrabara—D. Grey; Lipson—S. R. Furnell, S. B. Blacker, C. Laurie; Eurelia—A. Schnadt, J. J. Hamilton, C. Phillas; Mount Hope—A. Vigar, Thos. Speed, jun.; Bethel—M. H. Daeke, E. G. Schmidt, E. R. Peltz, T. Fiedler; Wepowie—W. H. King, F. Hetzel; Marama—S. A. W. Porker, J. McDonald; Cungena—J. B. Karutz, F. Williams, R. A. Adams, A. W. Taylor; Light's Pass—C. Roeburn; Kongorong—J. Bird; Wookata—E. J. Wilkens; Glossop—T. Gillespie, H. Morrell, E. R. Scott, A. Sandeman; Tarcoorie—J. A. Fiirst; Port Elliot—J. P. Colebatch; Block "E"—C. A. Ritchie, W. A. Pitt, G. Smart, E. W. Williams, B. Weber, A. Woodworth, E. Pullen, H. Skelsey; Shool Bay—R. Balchin; Kalangadoo—J. B. Hill, Geo. McDonald; Kalangadoo (Women's—Mrs. H. Rogers; Mount Barker—J. Downing; Kangarilla—F. Smart; Bentaboo Valley—T. Jones; Clare—W. H. Bond, jun.; Blackheath—

G. Nichols; Renmark—C. R. Clarke, H. Latz; Williamstown—W. men's—Miss W. Cundy; Big Swamp—G. A. Klau; Yaden—H. W. Fitzwater; Wilkawatt—A. Steele, L. Carter; Mannanarie—L. Wehr, R. Wehr, H. J. Cundy, T. Cahill; Tarlee—J. Devine, R. R. Lee, Robertson; Gumeracha—W. Noyce; Lyndoch—E. W. Bishop, L. Harper; Carrow—S. L. Bates; Collie—E. Shipard, J. Wright, R. Mills, K. Gunn, W. Cummings; Murray Bridge—G. Stephens, A. Jordan, W. Chennell, C. L. Bennett, T. G. Bennett, E. Nelson; McLaren Flat—J. C. Robertson, K. Robertson, G. Cooper, G. E. Baxendale, E. R. Martyr, A. J. Glover; Naracoorte—W. J. Dunne; Cobdogla—E. L. Hefford, A. Watkins, L. Saint, G. Cartthew, N. Coombe, G. Ellis; Morchard—J. M. Davill; Parilla—R. Jacobs; Paruna—J. Radcliff, C. McDonald.

THE AGRICULTURAL OUTLOOK.

REPORTS FOR THE MONTH OF NOVEMBER.

The following reports on the general agricultural conditions and outlook of the areas represented by the Government Experimental Farms mentioned below have been prepared by the respective managers:—

Boorowrie.—Weather.—The weather for November in a general way has been cool, with a registration of 28 points of rain up to the time of writing. Crops.—The crops are heavy, and good yields of both hay and grain should be obtained. Natural feed is very plentiful. Stock.—Livestock are all in good healthy condition. Miscellaneous.—Farmers are busy hay-cutting.

Eyre Peninsula.—Weather.—No rain fell during this month. Weather until the last week was really too cool for harvesting, but splendid weather followed. Crops.—Some crops have been harvested. Oat crops promise splendid yields, and so do some of the wheat crops. Wheat on fallow is looking particularly well, and has filled much better than other wheat. Barley is showing an average crop. Natural feed has all dried off, but there is an abundance of it. Speargrass is about 2ft. 6in. high all through the scrub. Stock all in good condition and free from disease. Pests.—The cutworms in the vegetable garden are our greatest pest at present. Miscellaneous.—Some farmers are commencing to talk of water shortage, and it seems that it will not be long ere they are hard at carting.

Kybybolite.—Weather has been fairly seasonable for the month. The early part of month was cool, with light rains. Strong winds were experienced during the middle of the month, followed by a period of high temperatures. About 116 of rain was recorded, which is below the average. Crops benefited by the rains, and the spring-sown barley crops have developed well. Summer crops have germinated well, especially maize. Natural feed is plentiful.

Turretfield.—Weather.—The weather has been exceptionally cool, only two of three hot days being experienced; 147 points of rain were registered. Crops have improved considerably, and a few nice cuts of hay will be made; in consequence of the wet winter and cool spring following a late sowing the harvest will be late. Natural feed has been plentiful, but is going off quickly. Stock are in good condition. Some farmers have had an epidemic of influenza amongst their horses. Pests.—Rabbits are becoming numerous. Miscellaneous.—The vineyards are looking well and are much better worked than last year.

DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, reported on December 1st, 1923:—

BUTTER.—The favorable weather experienced during the month has had the effect of prolonging the season, for the production has kept up remarkably well for this time of the year. This State's surplus butters have been placed in cold store with a view to being exported overseas, and London buyers have been in evidence operating most freely for all available quantities. As a result of the strong values ruling on the London market prices advanced 1d. per lb. as compared with last month. Choicest factory and creamery fresh bulk, 1s. 5½d.; second grade bulk, 1s. 3d. to 1s. 3½d.; best separators and dairies, 1s. 3d. to 1s. 4½d.; fair quality, 1s. 2½d. to 1s. 3d.; store and collectors', 1s. 1d. to 1s. 2d.

Eggs.—Quantities marketed at each auction were large with the exception of the last two or three sales, when consignments showed a marked decrease, and as pulp manufacturers and picklers were anxiously operating for their requirements, the market advanced. Fresh hen, 1s.; duck, 1s. 1d. per dozen.

CHEESE.—Fairly large consignments were forwarded from the South-Eastern factories weekly, but the demand experienced locally readily absorbed all available, whilst only limited interstate trade was done, the range being 1d. to 12½d. for large to loaf.

HONEY.—Many apiarists advise that their take will be considerably below that of last year; no doubt this is due to the exceptionally late and boisterous winter which we have experienced. In the course of the month the new season's honey has come to hand, and buyers are giving some preference. Last season's is therefore somewhat neglected. Values remain unaltered:—Prime clear extracted in liquid condition, 3d. to 4d.; best candied lots, 3d. to 3½d.; lower grades, 2d. to 2½d., according to quality. Beeswax, 1s. 4½d. for clear samples.

ALMONDS.—Very large quantities have been marketed, parcels finding ready sale to interstate and local buyers at the following rates: Brandis, 9½d. to 10d.; mixed softshells, 8½d. to 9d.; hardshells, 4½d. to 5d.; kernels, 1s. 5½d., in strong demand.

BAKON.—Towards the end of the month supplies improved considerably, and buyers were in the position of being able to secure their full requirements. An easing in values took place with sides and middles, but no variation occurred in the price of hams and rolls. Best factory-cured sides, 1s. 3d.; hams, 1s. 8d.; Hutton's "Pineapple" brand hams, 1s. 9d.; middles, 1s. 4½d.; rolls, 1s. 11d. to 1s. 2d.

LARD.—Hutton's "Pineapple" brand in packets, 1s. 1d.; in bulk, 1s.

LIVE POULTRY.—The poultry market right throughout the month continued brisk, but unfortunately supplies were not nearly equal to the demand. At each sale held buyers were in good attendance and eager to secure supplies, which resulted in most satisfactory values being obtained for consignors. Already butchers, restaurant-keepers, &c., are anxiously purchasing stocks for their Christmas requirements, and it is anticipated in the trade that only slight fluctuations in values will occur. Crates obtainable on application. The following rates ruled at our last auction for the month:—Prime roasters, 5s. 6d. to 7s. 6d. each; nice condition cockerels, 3s. 6d. to 5s. 3d.; poor condition cockerels, 3s. to 3s. 3d.; plump hens, 4s. 6d. to 6s. 2d.; medium hens, 2s. 9d. to 4s.; some tens of weedy sorts lower. Geese, 7s. 3d. to 8s. 3d.; ducks, good condition, 1s. 6d. to 10s.; medium ducks, 4s. 6d. to 6s.; fair condition do., 2s. 11d. to 3s. 3d.; turkeys, good to prime condition, 1s. 2d. to 1s. 9d. per lb. live weight; do., fair condition, 1s. to 1s. 11d. per lb. live weight; do., fattening sorts, lower figures, 10d. each.

POTATOES.—Since our last report the price of Victorian potatoes has eased somewhat owing to the new locals and Western Australians coming on to the market. Victorians are now realising 17s. 6d. to 18s. 6d. per cwt. and New Western Australians and locals, 17s. to 20s. per cwt. on rail, Mile End.

ONIONS.—Best quality new white onions, 10s. per cwt. on trucks, Mile End,

**IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC.,
OCTOBER, 1923.**

IMPORTS.

Interstate.

Apples (bushels)	8,374
Bananas (bushels)	10,406
Oranges (bushels)	3
Lemons (bushels)	1
Passion fruit (bushels)	338
Pineapples (bushels)	602
Tomatoes (bushels)	2
Peanuts (packages)	1
Beans (packages)	3
Swedes (packages)	157
Onions (bags)	891
Potatoes (bags)	29,534
Bulbs (packages)	15
Plants (packages)	16
Seeds (packages)	20
Wine casks, empty (number)	3,183

Rejected—2 bush. bananas, 1 package plants, 48 second-hand bags.
Fumigated—2 wine casks, 1 bush. oranges.

Overseas.

Federal Quarantine Act.

Seeds, &c. (packages)	5,133
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EXPORTS.

Federal Commerce Act.

Four thousand nine hundred and seventy-nine packages of dried fruit, 2,118 packages citrus fruit, 15 packages honey, and 20 packages preserved fruit were exported to overseas markets. These were consigned as follows:—

London.

Dried fruit	2,388
Citrus fruit	7
Honey	12

India and East.

Dried fruit	242
Honey	3

New Zealand.

Dried fruit	798
Citrus fruit	2,111
Preserved fruit	20

United States of America.

Dried fruit	11
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South Africa.

Dried fruit	1,540
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RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall of the subjoined stations for the month of and to the end of November, 1923, also the average precipitation to the end of November, and the average annual rainfall.

Station.	For Nov., 1923.	To end Nov., 1923.	Avg. to end Nov.	Avg. Annual Rainfall	Station.	For Nov., 1923.	To end Nov., 1923.	Avg. to end Nov.	Avg. Annual Rainfall
FAR NORTH AND UPPER NORTH.									
Armidale	0.05	2.10	4.64	4.93	Spalding	0.24	15.16	18.95	20.41
Marrar	—	3.70	5.37	6.14	Gulgare	0.41	18.22	18.26	19.34
Farina	—	3.35	6.08	6.73	Zacka	0.53	15.18	14.61	15.45
Dopley	—	5.59	7.59	8.50	Koolunga	0.33	14.85	15.36	15.87
Betania	0.07	6.16	8.18	9.65	Snowtown	0.19	14.47	15.32	16.06
Binnan	—	8.33	11.64	12.81	Brinkworth	0.23	15.97	15.35	16.26
Tareeola	—	2.86	7.27	7.91	Blyth	0.16	17.11	15.98	16.96
Hawkins	—	7.86	12.25	13.60	Clare	0.35	28.57	23.56	24.60
Hawker	0.03	10.91	12.02	12.93	Mintaro	0.52	30.66	22.38	23.40
Wilson	—	9.75	11.66	12.56	Watervale	0.49	29.76	26.43	27.44
Jordan	—	6.78	11.73	11.60	Auburn	0.41	26.02	23.25	24.30
Queen	0.23	12.23	13.47	14.24	Hoyton	0.10	16.62	16.99	17.85
Port Augusta	0.53	7.45	9.11	9.68	Balaklava	0.18	15.10	15.34	15.91
Port Augusta West	0.52	6.99	9.06	9.74	Port Wakefield	0.07	12.30	12.65	13.29
Bruce	0.30	7.28	9.97	10.76	Terowie	0.47	11.16	12.73	13.78
Hammond	0.46	11.07	12.09	11.90	Yarcowie	0.06	9.95	13.32	14.18
Wilmington	0.32	16.66	17.48	18.44	Hallett	0.39	16.39	15.44	16.47
Willowie	0.37	12.51	11.75	12.44	Mount Bryan	0.29	20.06	15.65	16.74
Melrose	0.85	26.79	21.41	23.88	Kooringa	0.49	16.39	17.15	18.06
Buderloo Centre	0.56	17.16	14.69	15.67	Farrell's Flat	0.32	20.61	18.05	18.97
Port Germein	0.03	12.40	12.07	12.93	WEST OF MURRAY RANGE.				
Wirrabara	0.94	20.25	17.75	19.85	Manoora	0.69	23.16	16.77	18.78
Appila	0.60	15.38	13.99	15.01	Saddleworth	0.62	22.16	18.77	19.74
Cradock	0.09	8.66	10.69	11.50	Marrabel	0.56	26.75	18.80	19.67
Watson	0.51	11.99	11.91	12.91	Riverton	0.52	27.15	19.87	20.71
Wingrove	0.32	8.59	9.99	10.85	Tarlee	0.59	26.20	17.02	17.81
Willa	0.37	12.03	12.71	13.56	Stockport	0.39	24.40	15.74	16.49
Wooro	0.37	10.94	12.91	13.75	Hamley Bridge	0.36	23.55	15.06	16.52
Ekara	—	6.18	11.30	11.85	Kapunda	0.54	25.44	18.92	19.80
Rocky Rock	0.37	13.85	11.92	12.73	Freeling	0.42	24.26	17.04	17.90
Witta	0.30	7.05	11.24	12.10	Greenock	0.65	30.23	18.67	21.60
Sherborough	0.57	14.24	12.57	13.53	Truro	0.95	27.54	15.21	20.86
Winala	0.83	13.77	13.56	14.51	Stockwell	0.79	27.68	19.30	20.31
LOWER NORTH-EAST.									
Atta	—	3.84	8.16	8.93	Nuriootpa	0.58	25.28	19.90	20.99
Ukuringa	—	4.80	8.06	8.61	Angaston	0.93	28.87	21.39	22.48
Naahili	—	4.28	7.97	8.79	Tanunda	0.95	29.60	21.21	22.20
Skiburn	—	4.10	7.67	8.42	Lyndoch	1.03	38.12	21.91	22.88
Open Hill, N.S.W.	0.03	6.87	9.16	10.08	Williamstown	1.10	38.66	26.34	27.47
LOWER NORTH.									
Port Pirie	0.12	12.72	12.79	13.55	ADELAIDE PLAINS.				
Port Broughton	0.24	14.62	12.63	14.27	Mallala	0.29	22.70	15.49	16.66
Porte	0.31	17.40	15.05	15.80	Roseworthy	0.21	21.38	16.49	17.29
Portra	0.92	20.44	17.32	18.25	Gawler	0.61	25.52	18.21	19.09
Portowie	0.82	18.18	16.18	17.19	Two Wells	0.10	20.37	15.05	15.83
Porttown	1.08	20.71	16.80	17.86	Virginia	0.15	23.29	16.31	17.31
Port Adelaide W. Wka.	0.43	18.78	17.91	18.05	Smithfield	0.23	26.12	16.35	17.16
Portstone	0.63	21.69	15.39	16.22	Salisbury	0.23	29.01	15.38	18.45
Port Brook	0.47	15.24	15.04	15.93	North Adelaide	0.55	30.85	21.17	22.22
Portretown	0.44	20.74	17.56	18.50	Adelaide	0.46	27.06	20.09	20.05
Porty	0.26	14.76	18.51	16.43	Glenelg	0.46	23.75	17.57	18.37
Porthill	0.28	15.79	17.22	16.93	Brighton	0.37	25.51	20.18	21.34

RAINFALL—continued.

Station.	For Nov., 1923.	To end Nov., 1923.	Avg. to end Nov.	Avg. Annual Rainfall	Station.	For Nov., 1923.	To end Nov., 1923.	Avg. to end Nov.	Avg. Annual Rainfall
MOUNT LOFTY RANGES.									
Teatree Gully.....	0.89	40.25	26.36	27.65	Talia.....	—	15.61	11.58	14.4
Stirling West.....	1.99	62.22	44.59	46.59	Port Ellioton.....	0.14	18.85	15.05	16.4
Uraidla.....	1.89	60.00	42.30	43.92	Cummins.....	0.12	20.21	17.86	18.2
Clarendon.....	1.05	40.61	31.63	32.98	Port Lincoln.....	0.20	18.88	18.99	17.1
Morphett Vale.....	0.54	27.12	21.90	22.79	Tumbi.....	0.17	12.40	13.74	17.5
Noarlunga.....	0.52	26.22	29.61	20.35	Carrow.....	—	11.63	13.66	14.8
Willunga.....	0.73	31.27	25.90	25.89	Arno Bay.....	—	11.03	12.45	14.2
Aldinga.....	0.63	23.68	19.71	20.35	Cowell.....	—	7.11	11.22	13.5
Myponga.....	0.76	32.98	28.58	29.16					
Normanville.....	0.48	26.12	21.89	20.61	WEST OF SPENCER'S GULF—continued.				
Yankalilla.....	0.55	29.70	22.36	23.10	Talia.....	—	15.61	11.58	14.4
Mount Pleasant.....	0.84	39.64	26.16	27.16	Port Ellioton.....	0.14	18.85	15.05	16.4
Birdwood.....	1.15	41.27	28.10	29.33	Cummins.....	0.12	20.21	17.86	18.2
Gumeracha.....	1.32	49.37	26.24	33.29	Port Lincoln.....	0.20	18.88	18.99	17.1
Millbrook Reservoir.....	1.18	51.12	—	—	Tumbi.....	0.17	12.40	13.74	17.5
Tweedvale.....	1.56	51.60	34.22	35.55	Carrow.....	—	11.63	13.66	14.8
Woodside.....	0.82	42.52	30.88	32.11	Arno Bay.....	—	11.03	12.45	14.2
Ambleside.....	1.09	47.53	33.35	34.67	Cowell.....	—	7.11	11.22	13.5
Nairne.....	0.80	33.25	27.28	28.42					
Mount Barker.....	1.65	44.24	30.01	31.18	YORKE PENINSULA.				
Echunga.....	1.37	45.05	31.75	32.96	Wallaroo.....	0.42	14.72	13.37	14.3
Macclesfield.....	1.03	38.16	29.42	30.57	Kadina.....	0.44	17.46	15.28	16.5
Meadows.....	1.44	46.13	34.69	36.04	Moonta.....	0.56	16.66	14.68	15.7
Strathalbyn.....	0.55	19.48	18.50	19.32	Green's Plains.....	0.26	18.63	15.22	16.8
MURRAY FLATS AND VALLEY.					Maitland.....	0.44	25.27	19.36	20.7
Meningie.....	0.52	22.00	17.90	18.66	Ardrossan.....	0.17	16.62	13.64	14.3
Milang.....	0.27	14.08	16.56	15.40	Port Victoria.....	0.16	20.09	13.91	14.7
Langhorne's Creek.....	0.55	17.53	14.00	14.61	Curramulka.....	0.23	20.62	17.50	18.1
Wellington.....	0.41	14.43	14.01	14.77	Minlaton.....	0.27	23.33	17.26	18.2
Taihem Bend.....	0.50	16.15	13.81	14.55	Brentwood.....	0.22	19.76	15.14	16.2
Murray Bridge.....	0.33	13.11	13.17	13.93	Stansbury.....	0.10	21.94	16.29	17.4
Callington.....	0.49	16.65	14.71	15.42	Warooka.....	0.24	25.50	17.22	17.8
Mannum.....	0.20	10.16	11.07	11.64	Yorketown.....	0.12	21.05	16.95	17.7
Palmer.....	0.18	16.68	14.70	15.47	Edithburgh.....	0.22	21.13	15.95	16.8
Sedan.....	0.26	13.37	11.72	12.29					
Swan Reach.....	—	9.73	10.38	11.08	SOUTH AND SOUTH-EAST.				
Blanchetown.....	—	5.05	9.47	10.16	Cape Borda.....	0.26	24.93	21.28	22.7
Eudunda.....	0.47	17.12	15.62	17.54	Kingscote.....	0.13	21.49	18.36	18.7
Sutherlands.....	0.33	11.64	10.52	11.19	Penneshaw.....	0.13	17.08	17.87	18.3
Morgan.....	—	6.77	8.55	9.30	Victor Harbor.....	0.54	20.91	20.63	21.7
Waikerie.....	—	6.89	9.09	9.91	Port Elliot.....	0.63	20.09	20.31	20.7
Overland Corner.....	—	6.04	10.28	11.07	Goolwa.....	0.28	15.79	17.14	18.7
Loxton.....	0.11	9.71	11.88	12.63	Pinnaroo.....	0.28	16.64	14.48	15.9
Renmark.....	—	7.58	11.21	11.09	Parilla.....	0.66	16.29	13.76	14.5
Monash.....	—	—	—	—	Lameroo.....	0.80	18.17	15.33	17.7
WEST OF SPENCER'S GULF.					Parrakie.....	0.65	16.62	13.71	14.2
Eucla.....	0.02	5.11	9.94	10.02	Geranium.....	0.59	18.32	15.68	16.3
White Well.....	—	5.04	8.60	9.08	Peake.....	0.63	17.18	15.82	16.8
Fowler's Bay.....	0.27	12.13	11.83	12.16	Cooke's Plains.....	0.40	20.03	14.37	15.4
Penong.....	—	12.64	12.06	12.49	Coomandook.....	0.34	16.57	16.71	17.2
Ceduna.....	—	9.56	9.77	10.36	Coonalpyn.....	0.57	19.66	16.50	17.4
Smoky Bay.....	0.05	12.93	10.43	—	Tintinara.....	0.79	21.75	17.63	18.2
Petina.....	0.07	13.68	12.47	13.34	Keith.....	0.71	20.21	17.21	17.7
Streaky Bay.....	0.09	14.64	14.64	15.10	Bordertown.....	0.79	21.11	18.31	18.4
					Wolseley.....	0.95	23.03	17.29	18.1
					Frances.....	1.22	23.89	18.48	19.5
					Naracoorte.....	0.75	24.35	20.92	21.7
					Penola.....	1.56	31.51	24.91	22.2
					Lucindale.....	1.16	25.55	21.83	22.7
					Kingston.....	0.73	24.05	23.94	24.7
					Robe.....	0.62	24.07	23.67	24.5
					Beachport.....	0.89	22.72	25.09	24.9
					Millicent.....	1.86	33.87	29.14	29.28
					Kalangadoo.....	2.67	37.66	—	—
					Mount Gambier	1.65	28.95	29.46	31.3

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meetings		Branch.	Report on Page	Dates of Meetings,	
		Dec.	Jan.			Dec.	Jan.
A'lawoona	*	—	—	Gladstone	*	21	18
Aldinga	*	26	—	Glencoe West	*	—	—
Allendale East	506	20	—	Glossop	501	19	16
Amyton	*	26	21	Goode	500	26	23
Angaston	*	—	—	Green Patch	*	17	21
Appila-Yarrowie	*	—	—	Gumeracha	*	24	21
Arthurton	*	—	—	Haldon	*	—	—
Asbourne	*	—	—	Hartley	502	19	—
Balaklava	*	8	12	Hawker	*	24	22
Balhannah	*	21	18	Hilltown	*	—	—
Marmera	*	17	21	Hookina	479	20	17
Beefalo Valley	483	17	21	Inman Valley	*	—	—
Belalie North	*	—	19	Irrimbank	*	22	19
Berrl	*	22	23	Kadina	*	—	—
Big Swamp	*	—	—	Kalungadoo (Women's)	512	8	12
Blackheath	*	21	25	Kalungadoo	*	8	12
Black Springs	*	—	—	Kangarilla	*	21	18
Blackwood	*	17	21	Kamantoo	*	22	19
Block E	*	—	—	Keith	*	—	—
Blyth	*	1	—	Ki Ki	*	—	—
Booleroo Centre	*	21	18	Kilkerran	488	20	17
Borrrika	*	—	—	Kimba	*	—	—
Brentwood	*	20	17	Kingston-on-Murray	*	—	—
Brinkley	*	22	19	Kongorong	508	17	17
Bundaleer Springs	484	—	—	Koonibba	*	21	18
Bute	*	18	22	Kopio	493	17	21
Butler	500	—	—	Kybybolite	*	R	R
Cala	*	—	—	Lake Wangary	500	22	19
Cadell	*	—	—	Lameroo	*	21	25
Canowie Belt	*	—	—	Laura	484	22	19
Carrow	500	17	16	Lenswood and Forest Range	*	—	—
Cherry Gardens	501	18	22	Light's Pass	484, 486	20	—
Clandfield	*	—	—	Lipson	500	—	—
Clare	486	—	—	Lone Gum and Monash	*	19	16
Clarendon	*	17	21	Lone Pine	*	22	—
Claypan Bore	*	—	23	Longwood	502, 505	—	—
Clive	*	19	16	Loxton	*	—	—
Collie	500	—	—	Lucindale	*	—	—
Colton	*	28	25	Lyndoch	486	20	17
Coomandook	*	19	16	McLachlan	*	1	—
Coonalpyn	*	21	25	McLaren Flat	*	—	—
Cradock	*	—	—	MacGillivray	503	18	22
Cryetal Brook	*	22	19	Maitland	*	29	17
Dargena	490	—	—	Mallala	*	17	21
Currency Creek	*	21	25	Maltee	500	21	18
Cygnet River	*	20	17	Mangalo	*	—	—
Barker's Peak	492	—	—	Manganarie	*	—	—
Binal Bay	*	—	—	Marama	501	R	R
Edithie	*	31	26	Meadows	*	19	16
Elbow Hill	*	25	29	Meningie	*	—	—
Fordia	479, 480	—	—	Milang	*	8	12
Farrell's Flat	*	21	—	Millcent	510	1	5
Frances	*	R	R	Miltalie	494	22	19
Gawler River	*	24	21	Mindarie	*	3	7
Georgetown	*	22	19	Minlaton	*	21	18
Geranium	501	29	26				

INDEX TO AGRICULTURAL BUREAU REPORTS—continued.

Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings.	
		Dec.	Jan.			Dec.	Jan.
Minnipa	*	19	16	Rockwood	504	17	21
Monarto South	*	—	—	Rosedale	*	—	—
Moonta	488	21	R	Easy Pine	*	—	—
Moorak	*	20	17	Sedgeworth	*	—	—
Moorlands	*	—	—	Saddleworth	487	11	—
Moorook	501	—	21	(Women's)	—	—	—
Morchart	479	R	R	Salisbury	487	4	—
Morphett Vale	*	R	R	Salt Creek	*	—	—
Mount Barker	506	19	16	Sandalwood	—	—	—
Mount Bryan	*	—	—	Shoal Bay	506	18	—
Mount Byran East	*	—	—	Smoky Bay	*	—	—
Mount Compass	*	—	—	Spalding	—	—	—
Mount Gambier	†	8	12	Stockport	—	R	—
Mount Hope	496	R	R	Streaky Bay	—	—	—
Mount Pleasant	506	—	—	Strathalbyn	—	18	22
Mount Remarkable	*	—	—	Talia	—	10	13
Mount Schank	*	25	22	Tantanoola	*	22	15
Mundalla	*	19	16	Taphan	*	18	22
Murray Bridge	501	—	—	Tarcowie	482	R	22
Mypolonga	501	19	16	Tarlee	—	R	R
Myponga	*	—	—	Tatiara	512	15	19
Myra	*	22	19	Tweedvale	*	—	—
Nantawarra	†	20	17	Two Wells	*	—	—
Naracoorte	510	8	12	Uraidla & Summertown	*	—	—
Narridy	*	—	22	Veitch	*	—	—
Narrung	*	22	19	Virginia	*	—	—
Neeta	*	—	—	Waikerie	*	—	—
Nelshaby	482	22	19	Wall	*	—	—
Netherton	501	R	R	Wanbi	*	—	—
North Boorbowrie	†	R	R	Warcoorie	—	—	—
North Bundaleer	*	—	—	Watervale	—	—	—
Northfield	*	—	—	Weavers	*	17	21
Nunkieri and Yurgo	*	3	6	Wepowie	*	R	R
O'Loughlin	*	19	16	Whyte-Yarcoorie	—	—	—
Orroroo	*	—	—	Wilkawatt	*	22	15
Owen	486	21	18	Williamstown	487	5	2
Parilla	†	R	R	(Women's)	—	—	—
Parilla Well	*	24	21	Williamstown	487	21	15
Parakie	*	—	—	Willowie	*	19	15
Paruna	501	R	R	Wilmington	*	19	16
Paskerville	490	21	18	Windsor	*	—	—
Pata	*	—	—	Winkie	*	17	—
Penola	†	1	2	Wirrabara	482	22	—
Petina	*	22	26	Wirregra	*	—	—
Pinnaroo	*	R	R	Wirilla	*	22	15
Pompoota	*	12	9	Wirrulla	—	—	—
Port Broughton	*	21	18	Woloba	—	—	—
Port Elliot	506	19	16	Wookata	497	22	—
Port Germein	*	39	26	Wudinna	*	—	—
Pygery	496	22	19	Wynarka	*	—	—
Ramco	†	R	21	Yacka	*	18	22
Rapid Bay	504	1	5	Yadarie	498	18	22
Redhill	§	—	—	Yallunda Flat	*	—	—
Rendelsham	511	19	16	Yaninee	*	—	—
Renmark	†	20	17	Yeelanna	*	22	15
Riverton	*	—	—	Yongala Vale	*	—	—
Riverton (Women's)	*	—	—	Yortekton	*	—	—
Roberts and Verran	500	20	17	Youngusband	*	22	24

* No report received during the month of November. † Held over until next month.

{ Formal.

R. Recess.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch

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REPORTS OF BUREAU MEETINGS.

UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

EURELIA.

September 14th.—Present: eight members and visitors.

FALLOWING.—The following paper under the heading "Fallowing and the Working of It," was contributed by Mr. C. Stott:—"One of the most important points in connection with the work of fallowing is to see that each share of the plough is cutting the correct width of land. A depth of 3½in. to 4in. I consider to be about the right depth for this district. I believe in harrowing immediately after the plough, when the fallowing is done at this time of the year, because this will assist the soil in retaining moisture and allow the weeds to germinate. If possible, the farmer should endeavor to cross-cultivate and harrow in order to reduce the soil to a level surface. I believe in cultivating to a fair depth to make the fallow mellow and keep it in good order. A disc cultivating plough is the most suitable implement for working the soil when it is in a dry condition, because it will pulverise the ground and assist in the retention of the moisture. Another advantage with the disc is that with a good team the farmer can average 50 acres per week."

HOOKINA (Average annual rainfall, 12in.).

October 25th.—Present: nine members and two visitors.

COLT BREAKING.—Mr. E. Wardleworth read a paper from the *Journal of Agriculture* dealing with this subject, and in the discussion that followed, Mr. K. A. Murphy said he favored a strong yard and crush-pen for handling the colt, in preference to a rope, and thought the horse should first be educated with one rein instead of two as suggested in the paper. He said the best way to teach a horse to pull was to hitch it to a log. Mr. J. Murphy thought it was always advisable to tie a young horse to an old one when the former was introduced to the team. Mr. H. V. Henschke thought the colt should be worked in a plough or scoop in order that it would become accustomed to the chains rubbing against its body and legs. Mr. P. Kelly said an application of salt water on the shoulders of the young horses, after the collar was taken off, was an excellent preventive of sore shoulders. Mr. S. Stone said if the colt were held back every night for some little time so that it could be caught easily next morning, there would never be any trouble to catch.

MORCHARD (Average annual rainfall, 13.50in.).

October 6th.—Present: 10 members.

CARE OF FARM MACHINERY.—The monthly meeting of the Branch was held at Mr. H. A. Toop's residence. An enjoyable afternoon was spent in inspecting the stock, implements, and farm buildings after which tea was provided by Mrs. Toop. The meeting was continued in the evening, when Mr. B. S. McCallum read an extract from the *Journal of Agriculture*, "Farming as a Business." A paper dealing with the subject, "Care of Farm Machinery," was then read by Mr. S. Davill, in the course of which he stated that the subject was one which should receive more attention than it did at the present time. Farmers were

frequently heard to say that they did not have sufficient time to adjust the machines properly, but he had found that five minutes spent in some simple adjustment would often save days of waiting for duplicate parts. There was no doubt that wire was of great value in case of emergency but it was very often noticed that when wire was used in place of a bolt or screw, it remained there for the rest of the season, and in some cases during the whole life of the machine. All machinery that was in danger of being affected by sun and rain when exposed to the weather should be kept under cover when not in use. Exposure to the weather for one season would do more harm than many years of actual work. An occasional coat of good paint was an excellent thing for any machine, especially one that contained wood and sheet iron. Every machine should be thoroughly overhauled before it was put to work in the field and should receive some little attention from day to day. Care should be taken to see that every bearing received a sufficient quantity of oil, especially machines that had a number of slow-moving parts. An interesting discussion followed.

EURELIA, October 12th.—Mr. G. Wheadon read a paper "Nitrogen and its Value," and an interesting discussion followed. Messrs. W. Canny and C. Stott gave a report of the proceedings of the Annual Congress.

MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

BEETALOO VALLEY (Average annual rainfall, 23.50in.).

September 24th.—Present: 13 members and two visitors.

FEEDING AND CARE OF LIVESTOCK.—Mr. E. H. Pearce read the following paper:—"To raise and feed livestock successfully in our district it is necessary to resort to more hand-feeding than is the customary practice. A larger area of barley should be sown for early feed, and a portion of the stubble sown with oats could be utilised in the same way. Oats when crushed make good feed for horses, cattle, or sheep, and if mixed in the chaff assist in conserving the haystack, which is too often on the small side. Plenty of water should always be available for all classes of stock. A good strawstack, in addition to providing shelter for the stock from the cold winds, would also be something dry for them to chew in wet weather. Hand-feeding should be started whilst the animals are in good condition, rather than allowing the stock to 'fall away' before they are given supplementary fodder. The dairy cow must have an allowance of grain if she is to give profitable yields. Sheep can be more profitably carried in our district if we adopt artificial feeding when feed is scarce, rather than putting them in the market and selling for what they will fetch. To obtain the best returns from pigs they should be fed with crushed grain, and in wet weather it is a good plan to give them a warm feed especially for the evening meal, and if given a warm place with a good straw bed on which to sleep, they will be a profitable source of revenue, rather than the underfed, stunted runts we see running about some farms. I favor cooking the food for pigs and steaming that which is fed to cows, in order to get the best results. Fowls should be housed in a dry place, free from draughts, and fed regularly night and morning, and if possible at midday."

BEETALOO VALLEY (Average annual rainfall, 23.50in.).

October 22nd.—Present: 12 members and three visitors.

POULTRY RAISING.—In the course of a paper dealing with this subject Mr. C. Cox said the main points that should be taken into consideration in poultry raising were the selection of a good breed and the careful management of the birds. The speaker expressed a preference for Black Orpingtons. They were good winter layers, good sitters, and good mothers. They were also very quiet. The main factor in the successful management of the flock was cleanliness in the roosting-houses, coops, and drinking vessels. To keep vermin, such as lice and tick, under control, the houses, &c., should be sprayed with disinfectant once in every four weeks. When setting a hen it was advisable to sprinkle her feathers

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with insect powder, or, if procurable, some leaves of the tobacco plant should be placed in the nest to keep the insects from disturbing the hen whilst she was sitting. He favored hatching the chicks with the hen, because with that method healthier chickens were obtained, and they were less trouble to rear. All misshapen, double-yolked, and soft-shelled eggs were useless for hatching. The chicks should be hatched in August and September, so that the birds would finish moulting before the commencement of the cold weather. If the hen had sandy legs she would transmit the disease to the chicks, but an application of kermes and lard would cure the complaint. All poultry should be housed at night to secure them from foxes. Crushed grain or bran and pollard should be fed to the young chickens three times a day, but when the birds were four to five weeks old two feeds a day would be sufficient. The writer's pen of Black Orpington fowls, which numbered 23, laid 2,016 eggs from April 1st, 1922, to March 31st, 1923, and the same hens hatched and raised 100 chickens.

NELSHABY.

August 25th.—Present: 17 members and visitors.

Mr. A. Bain gave a report of the proceedings of the Winter School for Farmers which he had attended at Roseworthy Agricultural College.

A further meeting was held on September 11th when a paper, "Drill v. Combine," was read by Mr. A. Loch, in the course of which the reader stated that he had used the combined implement and had found it efficient if worked properly. It was a labor-saver and also required fewer horses than the drill and cultivator worked as separate implements. In discussing the paper Mr. T. B. Haines favored the combine. He found that the wheat came up more quickly after the combine than when the separate implements were used. Mr. F. Jose had used the combine with satisfactory results. He found the sandy land did not drift so readily after the combine, and with that implement one was also able to commence work earlier after a damp morning than with the drill. Mr. Noble had found the draught light, and that the combine would go through a considerable amount of rubbish. He thought it an ideal implement for a one-man farm. Other members also expressed opinions in favor of the combine.

TARCOWIE (Average annual rainfall, about 15½in.).

October 1st.—Present: 14 members.

Mr. G. H. Watkins read a paper, "F.A.Q. Wheat Standard," in which he contended that the grading of wheat under the F.A.Q. standard was not satisfactory to the honest wheatgrower, because it permitted practically any kind of sample except that of very smutty grain to pass the standard. Mr. J. Ninnis concurred with the views expressed by the writer of the paper. Mr. D. Smith was of the opinion that if the farmer improved his seed and kept it free from all rubbish, he would obtain a higher price, and at the same time improve the standard of Australian wheats. Mr. W. S. Ninnis thought the introduction of bulk handling would be a step in the interests of the wheatgrowers of the State.

WIRBABARA (Average annual rainfall, 18.91in.).

September 22nd.—Present: 12 members and two visitors.

CLEARING TIMBERED LAND.—The following paper was read by Mr. E. B. Pitman:—"To bring heavy-timbered land under cultivation it is necessary to have a machine to pull the trees, and as many roots as possible, out of the ground. In this paper, however, I intend to deal mainly with that class of country where the timber is more or less scattered. I would first of all utilise those trees that are suitable for splitting into posts, shed forks, rails, &c., whilst the tops could be used for firewood. The boughs should be stacked around the stumps and burned. The presence of stumps and stones on land that is under cultivation is a hindrance to the thorough working of the soil. All large stones should be picked off and carted to creeks and gullies, where they will do good in helping to prevent flood waters from washing away the banks. If there are no creeks into which to tip the stones, they can be carted to the boundary fences. On no account should heaps of stones be made at the butts of trees, because if the trees have to be removed at any time, it will necessitate a second handling of the stones.

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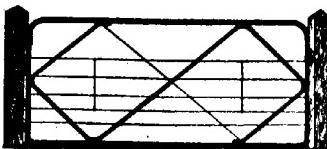


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Again, it is not a good plan to tip the stones on any except the very worst reefs, because even if you do not intend some day to clean out the reef, it is quite possible that the next man will want to do so. When the stones are once in the dray it only requires a few extra minutes to get them to the outside edge of the paddock. Short reefs which often jut out of the land should be cleared out in order to save the extra turning of the team. Small stones are best dealt with by means of a stonerake, when they can be forked into a dray from the rows left by the rake. During the last 20 years or so I have seen and tried many different ways of getting the land free of stumps, and I have come to the conclusion that the best plan to adopt is the following procedure:—The work is best carried out during the early autumn when the stump and material are both dry from the summer heat. Cover the stump with dry stable manure, put a match to it, and go on to the next stump and treat it in the same manner. If some of the surface soil is removed from around the stumps it will make a better job of the burning. Fine dry manure burns downwards and very rarely flares, so that the work can be started early in the season without the risk attached to other methods of burning off. Green stumps may need a second or third application, but the first burn will kill them and they will then be dry enough for the next season. Big solid stumps may burn for up to six weeks or more, but they will go to ashes if kept alight."

BUNDALEER SPRINGS, October 24th.—Eighteen members of the Branch paid a visit to the Beetaloo Valley Bureau and took part in an enjoyable tour of inspection of the district.

LAURA, September 25th.—Mr. H. R. Lines read an article dealing with the work of breeding rust and drought-resistant varieties of wheat, and the report of the delegates who attended the Annual Congress was received and discussed. The subject, "The Maintenance of Soil Fertility," was also brought forward for discussion.

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

LIGHT'S PASS.

September 27th.—Present: 17 members.

SPRAYING FOR BLACK SPOT OF THE VINE.—In the course of a paper dealing with the subject, Mr. S. Ellis said swabbing vines affected with black spot had been tried, but whilst it gave a temporary check to the spread of the disease, the fungus again made an appearance on the vines when they made further growth. The cheapest and most effective method of dealing with the trouble he considered to be spraying with Bordeaux or Burgundy mixture. Bordeaux mixture used before the flowering of the vines should be made as follows:—Bluestone, 6lbs.; fresh lime, 4lbs.; and water, 50galls. For spraying after the flowering of vines he suggested:—Bluestone, 5lbs.; fresh lime, 5lbs.; and water, 50galls. The Burgundy mixture, which should be used only up to the flowering stage, should be made with the following:—5lbs. of bluestone and 6lbs. of soda dissolved in 50galls of water. Although Burgundy had given good results, there was a danger of burning the foliage during the hot weather, and it washed off the vines should a rain follow its application. The most important point in the control of the disease was to see that the vines were treated at the correct time. If the vineyard had been severely attacked during the previous season and no steps had been taken to check the disease, he advised spraying before the bursting of the shoot buds, but if the rods left from the previous season were free from black spot, spraying would be unnecessary. When the shoots appeared a careful watch over the vines should be exercised, and on the first signs of the disease the vines should be sprayed, but if no spot appeared, spraying could be left until immediately before the bursting of the buds. After the flowers had set another inspection of the vines would be necessary, especially after showery or muggy weather, and if traces of the disease were in evidence the vines should be sprayed as occasion demanded, up till the first week in January. Should the

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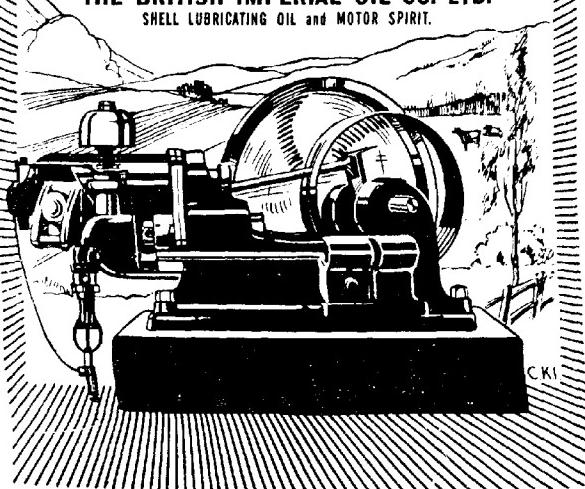
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season be one suitable to the spread of the fungus, he advised one spraying just before flowering and another two or three weeks later. If, however, the disease did not put in an appearance too early and did not spread very rapidly, one spraying, applied just before flowering or soon after the fruit had set, would be quite sufficient to check black spot. On no account should spray be applied during very hot weather. The vines should be given a thorough wetting, covering all the foliage and under the bunches of fruit. The nozzle should be directed by hand and not by a fixed boom, as was adopted by some growers. The best machine for applying the spray was a motor-driven pump that would maintain an even pressure of not less than 125 lbs., and reach 150 lbs. when the foliage was very dense. In spur vines and when two hoses were used, two rows could be finished at the same time, but in a double-wired trellis where the foliage was dense, it was better to spray each side of the row. For the smaller grower, a good hand-pump with one hose would prove quite satisfactory, provided the machine was able to register a good pressure and disperse a fine spray. He did not consider the use of a boom in the spraying outfit to be at all satisfactory. The amount of spray required for one spraying of spur vines would be about 100 to 120 gallons, and in the double-wired trellis, from 200 to 220 gallons per acre. On reckoning two men for spraying at 11s. per day, and a boy to drive at 8s. per day, and the materials required for the work, the cost of treating spur vines would be about 9s. or 10s. per acre, and 18s. to 20s. for vines on a double-wired trellis. These costs would, of course, be considerably reduced where the grower did not have to employ outside labor. The gain in spraying vines for black spot was great; an extra 2cwt.s. of grapes per acre in the spur vines and 4cwt.s. in the double trellis, would cover the cost of one spraying, allowing the price of fresh fruit at 26 per ton.

LIGHT'S PASS.

October 25th.—Present: 18 members.

SEED SELECTION AND CROSS FERTILIZATION.—In the course of an address dealing with this subject Mr. S. Plush pointed out that very careful selection of seed was necessary in order to obtain the best results. An interesting experiment in this connection was cited by Mr. Plush. Taking a certain variety of apple, he selected the plumpest and most healthy seeds and also the poorest seeds which showed signs of least development. Planting these in separate plots and tending each with an equal amount of care, he found that much better results were obtained from the better class of seeds. A larger and a better apple was the result from the best seeds selected, whilst those coming from the poorer class of seed deteriorated and produced very small and stunted fruit. Mr. Plush also explained how cross-fertilization and pollination was carried on in the selection of seed wheat. Each member cited various experiences, and the observations that were brought forward tended to point out that careful selection of the best class of seed was necessary in order to secure the best results.

CLARE, September 21st.—The report of the delegates to the Annual Congress was received and discussed. Mr. H. W. Moss then gave a short address in which he dealt with the cost of operating a tractor.

A further meeting was held on October 19th. Mr. R. J. Hague initiated a discussion on the subject, "Horses v. Tractor." Members were of the opinion that so far as local conditions were concerned, the tractor could only be regarded as an experiment, but in all probability mechanical power would be used more extensively in the near future. It was considered, however, that for hoeing, &c. horses would be more suitable than the tractor.

LYNDOCH, October 25th.—The Government Poultry Expert (Mr. D. F. Laurie) attended the meeting and delivered an address, "The Poultry Industry."

OWEN, October 17th.—Mr. R. C. Scott (Experimentalist, Roseworthy Agricultural College) attended the meeting and delivered an address, "Rotation of Crops."

SADDLEWORTH (WOMEN'S), September 18th.—A Homestead Meeting was held at Mrs. Garrett's residence. The report of the delegates to the Annual Congress was received, and discussion of the matter of staging an exhibit for the forthcoming local Show was also brought before the meeting.

SADDLEWORTH (WOMEN'S), October 9th.—Eight members and visitors attended the October meeting of the above Branch when a paper, "Domestic Insects and Pests," was read by the Hon. Secretary (Miss H. G. Coleman).

SALISBURY, September 4th.—The Hon. Secretary (Mr. A. W. Urwin) read a paper, "The Work of the Agricultural Bureau."

At a further meeting held on October 2nd the report of the delegates who attended the Annual Congress was received and discussed.

WILLIAMSTOWN (WOMEN'S), September 5th.—Mrs. E. Haworth contributed a paper, "The Danger of the Fly."

At a further meeting held on October 4th Mrs. Wild read an instructive paper, "Hybridising Roses," and at the conclusion of the meeting distributed a number of rose seedlings amongst the members.

WILLIAMSTOWN, October 19th.—Eighteen members and several visitors attended the October meeting, when Mr. A. Springbett contributed a paper, "The Best Method of Planting the Vine," and demonstrated several of the points of the paper with the aid of the blackboard.

WILLIAMSTOWN, October 25th.—The Government Poultry Expert (Mr. D. F. Laurie) attended the meeting and delivered an address, "The Poultry Industry."

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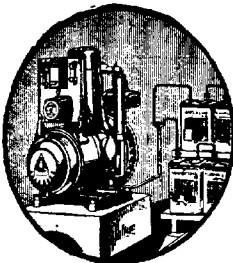
September 25th.—Present: eight members and four visitors.

FENCING.—The following paper was contributed by Mr. B. A. Koch:—“In the erection of a permanent fence the main factor to consider is the strainers. These posts should be of good solid timber, or preferably of iron or steel; a 6-in. railway rail makes a very good strainer, and is no more expensive than a sawn wooden post. These posts should, if possible, be placed in concrete, in order to prolong the life of the wooden post and to make the steel post stand more firmly in the ground. The next item demanding attention is to place a good strut against the post to keep it from shifting when the wires are being strained. These struts should be of iron or steel; one end should be placed about half way up the post, with the other end bedded in concrete, and a heavy stone at the base. Next, a long pole should be placed against the end post at one end of the line. This post should be visible from the other end, and a peg should then be placed about four or five chains from the latter end, exactly in line with the end posts. The posts should then be placed in line with this peg and the pole at the other end. When the first peg is reached another peg is put in line with this one and the pole at the other end. Always erect the posts according to the pegs. These posts could be from about 20 yards to two chains apart, according to the kind of stock kept and the position of the fence. The barb wires should be of 12 gauge and two in number. These wires should be strained as tightly as the wire will permit without breaking. While the barb wires are being strained they should be lifted off the ground by some means. I generally use iron posts tied together in the form of the letter X. These are placed underneath the wire sloping well away from the place from which the wire is being strained. As the wire is tightened the posts stand up and lift the barb off the ground. So soon as the barb wire is tight enough it should be pegged to the posts. All posts should be bored before they are erected, because this work can then be done with machinery, which saves a lot of time and labor. So soon as the barb wires are in position the iron posts can be driven in. These should be of heavy type and should not be more than 11ft. apart. Two flat iron posts, then one heavy T post placed alternatively, make a very good fence. For a sheep-proof fence six wires are necessary—the first set about 6½in. from the ground, then two 5in., two 6in., and 9in. at the top. For plain wires I prefer No. 8 gauge galvanized wire. Wires should in no case be put through a wooden post, but always around the end, and stapled to other posts. To prevent unwinding and breaking at the end posts, a half-hitch should be made after taking the wire around, and the end finally twisted around the strained wire. New or steel wire should always be used for splicing old iron wire, and for tying at the end of posts. All ends should be cut off short, which gives the work a neat appearance, and if old staples are taken off second-hand barb wire, it will also improve the fence. I would erect the strainer posts according to the length of the line, say up to 30 chains apart.” In the discussion that followed, Mr. C. Hienrich favored long strainers. Mr. B. J. Koch in erecting the fence made a practice of first erecting the end post, and then straining the barb wire, and from that a straight line would be obtained by which the other posts could be placed in position. Mr. S. T. Keightly thought 10 chains quite long enough for the length of a strain. Where the fence had to be erected in sandy soil he made a practice of leaving the wooden posts about 1ft. longer than was necessary, so that if at any time the sand drifted over the lower wires, fresh holes could be bored into the top portion of the posts, the wires raised, and the fence brought to the desired height.

MOONTA (Average annual rainfall, 15.22in.).

September 22nd.—Present: 18 members and visitors.

POULTRY.—The following paper was read by Mr. F. Trenerry:—“It is a recognised fact that farmers do not take care of their fowls, nor do they give them the necessary treatment chiefly because they do not realise what a valuable proposition poultry is as a side line on a wheat-growing farm. I consider that the



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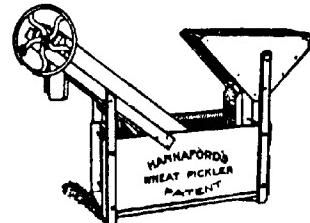
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majority of farmers lose from one year to another 20 fowls because the birds have been allowed to roost on the implements, in trees, and are totally unhusked and left to the mercy of foxes, which at certain times of the year are very destructive in this district. Twenty fowls valued at 2s. 6d. each means a loss of £2 10s. Twelve fowls out of the 20 laying each day would produce 36 dozen eggs, and valuing the eggs at 1s. 3d. a dozen throughout the year gives £22 16s. 3d. This amount, added to £2 10s., means a yearly loss of £25 6s. 3d. because the fowls are not given proper housing accommodation. Three hundred hens is not too large a number for any farmer to have for a side line. The selecting of the fowls should be given careful consideration. I favor equal numbers of White Leghorns and Orpingtons, because it is a good plan to dispose of the birds when they have laid for three years. A heavy breed, such as Orpingtons, will then make up for the loss on the lighter breed. A small incubator can be procured for about £8, and the cost of rearing the chicks to six months old would be about 4s. per head, a cost of £60. A house of fair quality, measuring 45ft. x 18ft., could be erected for £40, and it should easily accommodate 300 fowls. The cost of feeding the fowls without their going outside of the house can be estimated at 2½d. per head per week, but where the farmer is able to grow the greater portion of the feed, the cost of feeding would be considerably reduced. Three hundred pullets would cost about £3 2s. 6d. per week, therefore they would cost approximately £168 per year to feed. Two-thirds of the fowls would be laying each day and producing 116½ dozen eggs per week, which at 1s. 3d. per dozen equals £7 6s. per week, and for 52 weeks £379 12s. The initial outlay was £108, the cost of feeding them for the productive 12 months £168. These two amounts equal £276, and the fowls show a return of £379 12s., a profit of £103 12s. after an outlay of £108. This is a handsome profit, and one can easily allow, say, £3 12s. for a few birds dying through incurable diseases. The ensuing year the fowls would show a profit of £211, which is very profitable. The main points in the successful keeping of the birds are regular feeding and the keeping clean of the house. Tick can easily be kept out of the houses by painting the roosts and any crevices that are likely to harbor vermin with kerosene. The application of intelligence, good management, and energy will prove fowl-keeping to be a most profitable side line. In the discussion that followed, Mr. E. C. Atkinson said if poultry were to be managed as a profitable side line, it was necessary to give them a good deal of attention, and if any great number of birds were kept, it would take one man all his time to look after them. He thought that by letting the fowls have the run of the farm they would find half their food, and thereby save considerable time and labor. Mr. T. G. Cliff was not in favor of rearing the cockerels, because it would cost about 4s. to rear each bird, for which the farmer was only able to obtain about 2s. 6d. He did not think a farmer could feed the birds more cheaply than anyone else. Mr. E. H. Martin said if poultry were to be kept as a side line it was necessary to have the best breeds, to give them plenty of food and water, and not to confine them in a small space. Mr. A. B. Ferguson had never found the fowls a nuisance when they were allowed to run at large. He favored the hen for hatching, and thought the heavy breeds the most profitable for the farm. Mr. John Atkinson did not think it would pay the farmer to spend too much time with fowls. He did not favor the housing of poultry because it tended to increase the tick pest. Mr. T. H. Polgreen said if poultry were to be kept profitably they required a lot of attention, but he thought the housing of the birds was necessary on account of foxes.

PASKEVILLE, October 23rd.—Mr. R. A. Train read an article, "Mixed Farming on Small Holdings," and an interesting discussion followed.

WESTERN DISTRICT.

CUNGENA.

September 19th.—Present: 19 members and three visitors.

LAYING OUT THE FARM.—Mr. J. A. McInnes, who read a paper dealing with this subject, first emphasised the necessity for selecting a suitable place for the

rising ground. He suggested that the temporary house should be made on the site, because it would be useful for storage purposes when the permanent home was built at a later date. He then referred to the paddocks, and advised fencing the block in two large paddocks, taking care to make a good job of the boundary fences. If time was limited, he advocated at the start putting in half the number of required posts, and later on the fence could be completed. He was of the opinion that barb wire was a necessity on all farms, excepting in those cases where one was able to erect sheep-proof or netting fences. The barb wire, if put on the fence about 2ft. 9in. from the ground, would alone hold most stock, but for sheep-proofing or netting, it should be put on top of the posts. He advocated a uniform style of fence throughout the farm, care being taken to select good timber for the posts. When cutting posts or timber for any job, the trees should be cut close to the ground, so that no further cutting would be needed when the land was cleared. He next referred to brush sheds, and advised



the use of good timber for the uprights. The roof should be given a good slope by keeping the centre fork not less than 2ft. 6in. higher than the outside forks. The writer advocated wide gates, so that a team of eight or 10 horses abreast could be driven through, and thereby save time in moving large implements from one paddock to another. Struts were the main support of a fence, and corner and gate posts required very solid stays, which should be put well into the ground and bedded against a good block of stone. In the discussion which followed, Mr. Quinn said he favored placing the strut about half-way down the post. Mr. A. H. Hollamby did not favor strutting, but believed in putting the corner posts well down into the ground with a slight outward lean, so that when the fence was trained the strut would be pulled into a perpendicular position. Mr. O. H. Gerswartz did not favor strutting. Mr. R. L. Robertson advocated selecting a site for the homestead as near the centre of the block as possible, but the situation of the water supply should always be the determining factor. He also advocated making the fences a uniform size throughout the farm:—Posts 17ft. apart, 3ft. 4in. high, ordinary posts to be sunk 20in. into the ground, and strainers and corner posts 3ft. 6in. to 4ft.; barb wire on the top of the fence, and the first plain wire 10in. below for ordinary stock fences.

DAM SINKING.—Mr. H. C. Chappell, who read a paper dealing with this subject, said the position for the dam should be one that was recognised as the best catchment on the property, and the selected site should consist of land that could be ploughed satisfactorily. To determine these factors it was necessary to sink a few trial holes. After making the desired measurements, a peg should be driven well into the ground at each corner and cut off level with the surface. The best plan to adopt for the first two floors was to work the plough from corner to corner in order to enable the dirt to be scooped into the corner of the bank. If that were not done, trouble would be experienced in keeping the bank level. Prior to taking off the first floor it was necessary to plough around the whole of the dam to prevent digging into the edge of the dam when the plough was being worked. After the first floor had been removed it was necessary to measure 3ft. in front of the corner pegs and carry on from where a start had been made on the previous floor. If that were done it would be found that when the work was finished, the dam would have a slope which would be quite convenient for all stock. It was always advisable first to sink a catch-hole, and when the main dam was completed a trench and earthenware pipes could be used to connect the dam and the catch-hole. Galvanized troughing running from the pipes in the dam to the bottom of same would also be required to prevent the flow of water washing away the batter. A few rails should be placed around each end to prevent stock damaging the pipes and troughing. In some cases the dam would not hold the water at first, and when that happened, as many stock as possible should be put into the dam when it contained a small quantity of water, in order to paddle the floor. Care should be taken when ploughing not to cut too deeply near the edge of the batter. To prevent such an occurrence, he suggested that the cut on the plough should be altered to a depth of about 4in. nearest the batter, and the next furrow could be made 8in.; from then onwards the plough could be let in to its full depth, to prevent the ridging of the batter.

DARKE'S PEAK.

September 19th.—Present: eight members and five visitors.

THE FARM GARDEN.—The following paper was read by Mr. Geo. Noble:—
“The site selected for the garden should be close to the homestead in order to save labor and time. It should also be situated on a low-lying position, so that all drainage from the stables can be directed into the plot. When the rain falls the garden should be flooded in order to provide the trees with a good supply of subsoil moisture which is indispensable to the successful culture of fruit-trees. Melons, French beans, cucumbers, tomatoes, &c., can easily be grown by giving proper attention to the soil. If the soil is not especially suitable for a garden the water drained from the stables will make a very good substitute for summer irrigation. To make the garden secure against fowls, &c., it should be

enclosed with a 6ft. wire-netting fence. Give the land a deep ploughing, then apply a dray load of stable manure to every five square yards of soil, and then plough in the manure, which will make a good foundation on which to build the garden."

TOMATO CULTURE.—At a further meeting held on October 3rd Mr. Noble read the following paper dealing with the above subject:—"Take a square rod of soil and dig it early in the autumn before the rains, and apply one ton of well-rotted stable or pig manure. When the autumn or winter rains come divert as much water as possible on to the plot and mix the manure into the soil to a depth of 12in. to 15in. I have grown plants up to March without irrigation by following the above method. I recommend Large Red Dwarf tomatoes as the best variety. Take a box 15in. x 12in. x 6in. deep and into it place 3in. of rich soil. Sow the seed thickly and press it into the soil with the aid of a board. Sieve well-rotted manure over the top of the soil, again compact the seed bed with the board, and keep it well watered. Next tip a load of fresh stable manure against a wall so that it will receive the direct rays of the sun, and place the seed box down to the level of the top of the manure. Cover the top of the box with a piece of glass and keep the soil wet. The plants should show up three days after sowing. I advise sowing the seeds about the 1st of May. When the plants are up, say nine days, they should be about 1in. high, and the box can be taken out of the manure and placed where it will receive plenty of sunlight, care being taken to protect the seedlings from cold winds. The glass can be removed on sunny days, but it should always be replaced at night, or during cold windy weather. Thin out the plants to the number required and keep them well watered. Set out the plants about the beginning of September in rows 3ft. 6in. apart, with the plants 2ft. apart in the rows. Next, secure stakes 4ft. long and 1in. thick and place one close to each plant, driving it firmly into the ground. This job should be done early in September, or just after planting out the tomatoes. Cover the plants on the south and west sides with tins that have been cut in halves, and see that a hole for the stake is made in the top of the tin to keep it in position. The tins create artificial heat which forces the growth of the tomatoes, and warms off the cold winds and frosts. Keep the tins in place until the plants are about 1ft. high. If fine and warm weather is experienced, the tins can be removed. Give each plant about one pint of water when it is planted out, and after three or four days break the surface soil around the plants with a hoe or fork. By keeping the surface soil cultivated to a depth of 2in., the moisture will be conserved, and it will also destroy surface roots and tend to send the roots down deeply into the prepared soil. Cultivate the plot three times a week and good results will be obtained. A small grub about 1in. in length sometimes attacks the young plants, but by keeping the soil stirred up around the plants, the grubs will not do very much damage. Later on cut worms may also put in an appearance, but by irrigating around the plants the insects will be kept under control. Tie the plant to the stake after it reaches a height of 1ft. As the leaves sprout out from the stem, a lateral and also fruit flowers will be noticed, between the stem and leaf. Suppress the laterals by taking them out close to the stem with a knife or the finger-nails, care being taken not to injure the leaves or fruit flowers. Allow one stem to run up and tie it to the stake. Keep all laterals suppressed and tie a piece of twine under each bunch of fruit as it appears, care being taken to see that the stem is not cut by the string. Two stems can be made on a plant if it is making vigorous growth. If early fruit is desired, allow two or six bunches of fruit to set and then nip out the top of the stem. This will make the tomatoes develop more quickly. If the upper leaves curl, it is an indication that the plants are in need of water. Do not forget to cultivate the soil around the plants two or three times a week. If this practice is carried out the plants will not require water until March. Liquid manure has a tendency to bring the roots to the surface, which results in the burning of the feeders by the sun. If the plant has to be watered give the ground a good soaking and follow with a thorough cultivation."

KOPPIO (Average annual rainfall, 22.60in.).

September 25th.—Present: 10 members.

THE CARE OF THE FLOCK.—The following paper was read by Mr. M. Gardner:—"To farm successfully it is necessary to keep sheep. Before sheep can be kept the question of feeding has to be considered and the quantity of feed

and water that is available will determine the number of sheep that can be kept. It is a good plan to bear in mind that it is better to understock than overstock. One of the most essential factors in the successful handling of the flock is that the farm must be well and securely fenced. I have come to the conclusion, after considerable experience, that it is impossible to keep sheep satisfactorily unless the paddocks are very securely fenced. It takes very little more feed to keep a good sheep than to keep a poor one and the results at shearing time will tell which is the better proposition. I favor mating the ewes with the rams in November, and always endeavor to have a paddock of good feed and shelter saved for them into which they can be placed during March. The ewes should then be in good strong condition for lambing, for if the ewes are strong there is not much danger of foxes taking the lambs. I have watched the practice of hand-feeding lambing ewes, but in my opinion it is not very successful, because the ewes, being hungry, leave the lambs to come for feed. If feed is scarce, the better plan is to let the dry sheep go short in favor of lambing ewes and hand-feed the dry sheep. About a month before the ewes begin to lamb they should be yarded and crutched. To handle sheep profitably, it is necessary to have a dog that will help in the driving, mustering, and yarding. A good dog is a valuable asset and often saves time and labor. It is also necessary to have drafting yards and a receiving yard. The receiving yard should be large enough to hold the whole of the flock. In order to gauge the size of the yard, the farmer should allow two sheep to the square yard of surface, and it is always a good plan to allow a little extra space when building the yards. The small drafting yards can be used as catching pens for crutching, &c. Not only the ewes but all the sheep should be crutched before the commencement of the wet weather, because the wool can then be saved and a good price obtained at next shearing time. When the crutching is being done the wool should be removed from around the eyes of any sheep if it interferes with their sight. It is also a good plan to trim the feet of any sheep whose hoofs are making an abnormal growth. An ordinary pair of sharp carpenter's pincers does this very well. One often notices dirty and neglected sheep in the flocks and this, besides being wasteful, is cruelty to dumb animals and a source of danger in attracting blowflies. Some seasons grass-seeds are very bad, and when such is the case it is very necessary to pay particular attention to weaners, because it is often necessary to trim around their mouths, eyes, throats, and legs. This work should be done before the seeds work into the flesh. An advantage in having early lambs is that the lamb cuts a few pounds of wool. After weaning a chance is given to put on condition before the feed gets dry. After shearing a very important item in the care of the flock takes place—dipping. This should be well and carefully done by men who have the care and consideration of the sheep at heart. Too often sheep are rather roughly handled when being dipped. Dipping makes a considerable difference to the sheep, and the work should be done thoroughly. Tick-infested sheep cannot thrive and produce wool equal in quality to those free from tick, hence the value of dipping. Sheep are equal in quality to those free from tick, hence the value of dipping. Sheep are equal in quality to those free from tick, hence the value of dipping. Sheep are equal in quality to those free from tick, hence the value of dipping. Sheep are equal in quality to those free from tick, hence the value of dipping.

Time spent on the care of the flock means extra profits in wool returns.

MILTALIE (Average annual rainfall, 14.55in.).

October 20th.—Present: six members and visitors.

KEEPING RECORDS OF THE WORKING OF THE FARM.—Mr. A. M. Wilsen read the following paper:—“Every farmer who is alive to his own interests should keep records of his holding, and it is an excellent idea to have a plan of the farm drawn up and each paddock and fence defined thereon. The condition of each paddock when fallowed and cropped last, the yield of the crop, the variety of wheat sown, whether improvement can be made in the methods of cultivation and particulars of mistakes that might have been made, should all be recorded. Such a record will enable the farmer to profit by experience. A lesson may be forgotten and a mistake of previous years committed again, but if these have been noted, it should be impossible to make the same mistake again. A farmer should also keep a record of all the livestock; the number of horses bought and

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sold during the year, how many mares foaled, any losses of livestock, and the name of the stallion serving the mares. The same plan could be followed with cattle and sheep, especially regarding the sales and prices obtained. A record of the breed of ram and the time of mating with the ewes will enable the farmer to guard against inbreeding. By the farmer interested in fruit-growing and gardening, a record should be kept showing the dates of plantings and the results from the trees. Such a book would make an excellent history of the farm and would save a good deal of trouble when the annual statistics are required. In the records of the farm I think it is advisable to make a note of the date of the purchase of any implement, the price paid, and the length of its working life, how many tons of hay were cut, and the number of bags of wheat and oats grown annually. If during the year any permanent improvements, such as sheds, tanks, fences, &c., have been made, it is well to place them on record. The farmer should also keep a record of all income and expenditure during the year. There are such items as sheepskins, horsehair, &c., which are sold in small quantities, and very often no record is kept of these and other by-products of the farm. Such a book of records and facts would help a farmer in ascertaining his correct financial position, and would also assist him in a small measure to work his holding successfully.

MOUNT HOPE.

October 20th.—Present: 10 members and one visitor.

HINTS ON SHEEP DIPPING.—Mr. D. Speed contributed a paper on this subject. In mixing powder dips, he said, time and care would be amply repaid. The best method was to mix the powder in kerosene tins or drums. The packet of dip should be beaten smartly before the paper wrap was broken. One packet of dip should be emptied into each tin or drum. A small quantity of water should then be poured on to the dip and the mixture thoroughly stirred, more water being added gradually until the mixture was of the consistency of thick cream. Rain water should be used if obtainable. The best results would be obtained if the preliminary mixing were done two or three days before the dip was required because the mixture was then in a soft, creamy state and blended readily with the water in the bath. The mixture should be stirred occasionally, and the quantity of water in the bath should be measured with a measuring stick and the side of the bath permanently marked with the level of each hundred gallons of water. On the morning of dipping more water should be added gradually to the creamy mixture in the tins until they were three-parts full, the mixture being stirred vigorously. The contents of the tins should then be poured into the bath through a strainer to prevent any undissolved lumps entering the bath. The bath should then be stirred thoroughly. If a number of sheep were to be dipped it would necessitate replenishing the bath. The sheep should not be hurried through the dip, neither should they be driven whilst wet, but should be given plenty of time to drain and left under shady cover until dry. During the discussion which followed Mr. H. F. Myers emphasised the fact that the sheep should not be hurried through the dip. Several members thought that the best results were obtained when the sheep were dipped straight off the shears. Mr. W. Mahoney tabled some fine samples of turnips, swedes, and radishes. The average weight of the swedes was about 3lbs., and the turnips were almost as large. The samples were perfectly sound, and the members congratulated Mr. Mahoney on his fine exhibit.

PYGERY.

August 28th.—Present: eight members.

SEED WHEAT.—In the course of a short paper dealing with this subject, Mr. D. M. Smith made reference to the far-reaching effects that the work performed by the late Mr. W. Farrer had had on the wheat-growing industry of Australia. The speaker then gave an account of the method adopted in Canada to secure the improvement of seed wheat under farm conditions. The persistent use of the grader, Mr. Smith believed, would increase the grain yield of the State by 5 per cent. A keen discussion followed.

HOW TO KEEP THE BOY ON THE FARM.—At a meeting held on September 23rd Mr. R. Woodruff read the following paper:—“In dealing with this subject I make no pretence at dealing with the matter of parental control, but merely desire to offer a few suggestions as to how the boys of to-day can be encouraged to remain on the land. Of late years there has been a considerable drift of the rural population towards the city, which can possibly be accounted for because of the remunerative positions and attractions that the city has to offer. When we think of this as compared with the every-day sameness of country life, and the fluctuating returns of the farmer of good and bad seasons, there is no wonder at the longing of the boys to be a part and parcel of this brighter and more attractive city life. This desire comes to the boy when he reaches that age and stage of life when he thinks he is a man and his father thinks he is a boy. This, I consider, is the critical stage, when the efforts of the father are required to offer good counsel and encouragement, and to show by practical means to the boy, that by remaining on the farm there is something more in sight for him than just hard work, no pleasure, and less pocket money. I do not think a boy should be made to stick to farming as an occupation if he has his mind set on some other trade or occupation, because it is probable he will not make a successful farmer if this is the case. It should be the aim of parents to allow their boys plenty of recreation, and to encourage them to take part in outdoor games and the social functions of the district. The boys should be taught to take an interest in the work of the farm, and also in the stock. This could be done by giving them the crop yielded from a piece of ground from which they have picked the sticks or by giving them so many sheep or a calf. Care should be taken that these promises are kept or the boys will naturally become disheartened and discontented. As they become interested in agriculture they should be allowed to travel frequently and to visit agricultural shows in the city or other country centres and they will thus become acquainted with modern ideas in agriculture. Further, the boys' home life should be made as attractive as possible, and some musical instrument should be provided.”

WOOKATA.

September 22nd.—Present: 12 members and two visitors.

FARM TRACTORS.—Several papers on this subject, taken from the *Journal of Agriculture* were read by Mr. Hobbs and Mr. A. Oats. A good discussion followed. Several members expressed the opinion that the tractor would have to prove its suitability for rolling down scrub before it became popular in this district. Other members thought it would be necessary for the tractor to be so devised that in the event of the plough getting hooked fast in a large stump the power would be automatically released to prevent serious damage. No one doubted that the tractor would be economical for ordinary farm work so far as fuel and lubrication only were considered, but the item of depreciation was expected to be a serious one.

WOOKATA.

October 20th.—Present: 14 members and three visitors.

HAYMAKING.—The Chairman (Mr. F. M. Underwood) read the following paper:—“Portions of South Australia are subject to periods of drought, and a good stack of hay on the farm is absolutely essential. It is advisable to have sufficient hay to carry over at least two years. By cutting a little more in the green seasons, when it is not difficult to get a good cut of hay, the surplus will tide over the period when sufficient hay cannot be obtained. Every farm should have at least 50 tons of hay always on hand. On a new block the farmer should have two paddocks of 50 acres each for the purpose of growing hay; one could be fallowed whilst the other was growing a crop. If 100 acres of scrub land could be cleared and all the stumps rooted out, a farmer in this district would be sure of a fair cut of hay in any season. It is an established fact that the scrub land grows better and heavier crops than plain land, and this means more hay with less work. Early varieties of wheat or oats should be sown for hay, so that hay can be cut and stacked before the commencement of reaping. Smart's Early is the only wheat I have had experience with for hay, and it has proved satisfactory. I have not eaten oats, but prefer eaten hay to wheaten, for feeding

to horses. The periods for cutting hay vary according to how it is to be used. If it is to be chaffed, I would leave the cutting until the grain is well formed. If it is to be fed to stock as long hay, then I would cut it, say, at least a fortnight after it has flowered. There is a good deal of waste in feeding long hay to stock, and I prefer to use chaff. When the hay is cut it should be stooked immediately behind the binder. The stooks should each contain about 40 sheaves, care being taken to stand the sheaves in an upright position. If a little care is taken with the stooking, it greatly reduces the danger of damage by wind or rain. Sufficient attention is not paid to this part of the business, and one frequently sees the stooks blown about by the wind, thus leaving them exposed to the rain. If the operator of the binder drops the sheaves in straight rows, the stooker can put the stooks in the same manner, and thereby facilitate carting. The hay should not be carted until it is thoroughly dry. This can be tested by examining centre sheaf of a stool. Take a handful of hay from the middle of the sheaf and screw it up, and if it is dry it will be brittle and snap when broken. If the weather is dry and warm, nine days is generally long enough to leave the sheaves in the stooks before stacking." In the course of the discussion that followed, some members agreed with the writer that enough hay should be on hand to carry the farmer over a period of drought, but they were of the opinion that mice did a lot of damage to hay when it was kept for any length of time, unless the farmer was in a position to erect mouse-proof yards. Mr. H. V. Hobbs agreed that Smart's Early was a good hay wheat, but he preferred Sultan and Caliph, and especially the former, which was a solid straw variety. He was in favor of Ruakura oats for hay, but was growing Early Burt oats for the first time, hoping they would prove a more suitable oat for hay. He favored round stooks, and thought the hay should be left in the paddock for at least a fortnight before being carted. Mr. R. Giles found horses did better when fed on wheaten hay than when fed on oaten hay. Regarding the point as to the correct stage at which to cut the crop, members differed in their opinions, but thought wheaten hay was not so likely to be damaged by mice, and to get the best results it should be cut when the grain was in the milky stage.

YADNARIE (Average annual rainfall, 14.09in.).

September 29th.—Present: 13 members and visitors.

HARVESTING WHEAT FOR HAY.—The following paper was contributed by Mr. W. L. Brown:—"There is scarcely any commodity put upon the market which varies so much in quality and appearance as hay. In many districts very little care is given to this product, and it is regarded only as a convenient method of getting something for that which is worth very little. Chaff production is rather different from other classes of farm enterprise, for chaff is not always the result of a crop grown intentionally for the purpose. Producers of chaff may be divided into two classes; those who grow for the purpose, and those who grow grain, but who, owing to frost, weather, or other causes, have to cut the crop for hay and convert it into chaff. The best hay wheats, in my opinion, are those which yield straw and flag, of good color and body. The crop is at its best stage for hay a few days after it is in flower, for at this stage the plant contains its maximum amount of nutritive qualities, and at the same time the nutrient is evenly distributed throughout the whole plant. This is as it should be, for when preserved as hay the whole of the plant has to be eaten, and not only the ears. Though the crop at this stage contains the maximum nutritive qualities, it has not reached the stage when it will produce the greatest weight of hay. The dry matter in the plant increases until it is mature, and because of this, some farmers do not cut until well past the flowering stage in order to get a greater quantity of hay; the extra weight is gained at the expense of feeding value and color. In both matters of variety and of time of cutting the grain-grower is at a disadvantage, more especially when he delays cutting as long as possible in the hope that he will get a crop of grain. In this case the only advice that can be offered is, cut at the earliest possible moment that you are satisfied the grain yield will not be profitable. To cut at the right time to secure the best food value it is essential that it be dried, and so preserved with as little loss as possible of food value. Two causes of loss are the result of rain washing out the sugar and other soluble ingredients, and the heat of the sun bleaching the hay. The sheaves should be stooked as soon as possible after the binder. The sheaves in long stooks

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stocks dry more rapidly than those in round ones, because more sheaves are exposed to the sun. Long open stocks are suited for moist districts, and large round ones for dry districts. Sheaves remain in the stocks until the hay is dry that when it is placed in the stack it will not heat or mould. This stage is determined by drawing a handful of straws from the middle of the stock and examining the nodes or joints in the straw. If these are dry the hay can be safely stacked. This period is usually reached between 14 and 18 days. It requires watching, however, as the stage at which it is carted in will influence its quality. If the upper joints have shrunk it may be taken that the hay is dry enough to stack. If taken in before this takes place, it is apt to sweat, if left too long after this stage has been reached it will so harden as to make it difficult to turn out good chaff." In the discussion that followed Mr. G. B. Kobelt said in new mallee districts farmers had to grow oats to prevent take-all and consequently in many instances oats were cut for hay instead of wheat. He favored large round stocks. Mr. F. W. Jericho said large stocks would not blow over so easily as small ones. Mr. W. O. Kruger also agreed with the writer's remarks, and said wheat and oats sown together made excellent hay. He believed in cutting oats on the ripe side and spoke in favor of big stocks containing about 90 sheaves. The Chairman (Mr. A. Spriggs) favored cutting wheat for hay on the green side and oats on the ripe side. Oats could some years be cut fairly green if the stems had turned a blood-red color. He varied the size of the stocks according to the length of the hay.

BUTLER, November 4th.—Several matters of local importance were brought before the meeting for consideration, and interesting discussions ensued.

CARROW, September 26th.—The report of the delegates to the Annual Congress was received, and members discussed the question, "Tillage of the Soil and General Farming Practices."

CARROW, October 24th.—Mr. M. Bawden read an extract from the *Journal of Agriculture*, "Farm Management and Efficiency," and an interesting discussion followed.

COLLIE, October 9th.—Mr. C. A. Goddard (Assistant Wool Instructor at the School of Mines) attended the meeting and delivered an address, "Care of Sheep and Wool."

A further meeting was held on October 27th, when several subjects of local interest were brought forward for discussion.

GODDE, August 29th.—Mr. L. Will gave an address in which he dealt with the subject "The Objects and Value of the Agricultural Bureau."

A further meeting was held on September 26th, when the subject, "Eradication of Charlock," was brought before the meeting. Mr. S. Will was of the opinion that a flock of sheep allowed to graze on the plants when they were bursting into seed would keep the weeds under control. Messrs. P. Linke and P. Hunt said cattle also ate charlock readily. Mr. C. Will said that the weeds could be destroyed if the land was cultivated when the plants were small.

LAKE WANGARY, October 12th.—Mr. C. A. Goddard (Assistant Wool Instructor of the School of Mines) attended the meeting and delivered an address, "Handling the Farmer's Clip." A practical demonstration of wool-classing was also given by Mr. Goddard.

At a further meeting held on October 27th, extracts from the Departmental Bulletin, "Tillage of the Soil," were read by Mr. P. Houston, and a good discussion ensued.

LIPSON, September 22nd.—"Farm Management" was the subject of a paper read by Mr. W. Brown, which provoked a keen and interesting discussion.

MALTEE, October 16th.—Fourteen members attended the October meeting of the above Branch, when several subjects of local interest were brought forward, and an interesting discussion followed.

ROBBETS AND VERRAN, October 18th.—Mr. M. Masters read a paper, "The Advantages of the Agricultural Bureau." The subject, "Registration of Stallions and Bulls," was also discussed, and the delegates to the Annual Congress and Minnipa Conference gave an interesting report of the proceedings of both gatherings.

EASTERN DISTRICT.

NETHERTON.

October 19th.—Present: 14 members and four visitors.

WHEAT-GROWING.—In the course of a paper under the heading of "Is Wheat-growing Profitable at the Present Price for Wheat?" Mr. McLean suggested growing oats, barley, and peas instead of wheat, and expressed the opinion that advertising and wool-growing would be more profitable especially if the destruction of foxes were enforced. He suggested that a bounty should be paid for foxes' scalps, as was done for wild dogs. If Australian wheat were graded under the same system as was practised in Canada, he thought that would make a great deal of difference to the price.

GERANIUM, September 22nd.—The meeting took the form of a debate on the subject "The Tractor v. the Horse." Mr. W. J. Mitchell supported the use of the tractor, whilst that of the horse was argued by Mr. W. Pannell, and a lively discussion followed.

GLOSSOP, October 3rd.—Mr. G. J. Jackson gave an account of the Winter School for Farmers that had been held at Roseworthy Agricultural College, and read a paper dealing with "Ailments of Livestock," from notes that had been compiled from lectures given at Roseworthy Agricultural College and standard veterinary publications. Mr. Ellis read the annual report, and the officers were elected for the ensuing year.

MABAMA, October 22nd.—The paper, "Tillage of the Soil," which was contributed by Mr. W. J. Spafford, Superintendent of Experimental Work, at the Animal Congress, was read by the Hon. Secretary (Mr. T. C. Hinkley), and a good discussion followed.

MOOROOK, October 26th.—The Assistant Government Veterinary Surgeon Mr. F. Murray Jones, B.V.Sc., M.R.C.V.S., attended the meeting and delivered an address, "Common Ailments of Horses," to a gathering of 19 members and the visitors.

MURRAY BRIDGE, September 7th.—The Vice-Chairman of the Advisory Board of Agriculture (Captain S. A. White, C.M.B.O.U.) delivered an address, "Across Australia by Motor Car," to an audience of 40 members and visitors.

On September 29th a large number of members of the Murray Bridge, Cheltenham, Mount Barker, Strathalbyn, and Mypolonga Branches of the Agricultural Bureau inspected the S.A. Farmers' Co-operative Union milk factory at Murray Bridge, and took part in a river excursion to Wood's Point.

MYPOONGA, October 22nd.—Mr. N. Forester (Recorder of the River Murray Herd Testing Association) attended the meeting and delivered an address, "The Advantages of Herd Testing."

PARUNA, October 12th.—A discussion took place on the use of sheep in preference to working the land with implements in order to keep rubbish down in the fallow. Mr. C. G. Patch considered that in a year such as the one through which they were passing it would not be possible to keep fallow clean without the aid of sheep. Mr. Groom contended that it would be more profitable to employ an extra team rather than rely on sheep. Messrs. Bowman and Reichstein were of the opinion that only by the judicious use of sheep, the cultivator and harrow, could satisfactory fallowing conditions be obtained.

SOUTH AND HILLS DISTRICT.

CHERRY GARDENS (Average annual rainfall, 35.03in.).

October 23rd.—Present: 13 members.

ROTATION OF CROPS IN THE VEGETABLE GARDEN.—In the course of a paper dealing with this subject, Mr. H. Strange said it was not advisable to sow root crops such as carrots, parsnips, &c., too frequently on the same piece of land.

Those crops should not be sown more than once in three years. If crops were sown too frequently the plants appeared to be very susceptible to such diseases as yellow leaf and mildew and, when once these appeared in the garden, they were difficult to eradicate. The same plan should also be followed out with turnips and swedes, the first-mentioned being very subject to "die down," a disease known by the growers in the hills. If turnips or swedes were grown on the same land for more than one year, it was necessary that when one crop was taken off the land should be ploughed and left to the sweetening effects of the sun, but even in that case there was a good deal of danger attached to the growing of turnips and swedes for more than two years in succession. Lettuce was not a profitable vegetable in the hills, but the crop could be grown if it was planted on land that had previously carried potatoes. Mr. Strange said it was possible to grow profitable crops of cabbages and cauliflowers on dry land every year, provided the land was fallowed during summer; but the better plan was to plant cabbages and cauliflowers after a crop of peas or potatoes at intervals of two years. Personally, he thought no attempt should be made to grow the cruciferous plants more frequently than two years in succession, because they were subject to the diseases known as clubfoot and mildew. Potatoes and tomatoes belonged to the same family of plant life, and on no account should they follow one another. They would yield better crops if they were not sown more than two years in succession on the same piece of land. He had found that by planting garden peas and French beans after the land had carried either tomatoes, potatoes, cabbages, or cauliflowers, a much better return was secured than if they were planted two years following on the one block of soil. The speaker stated that he had given up trying to grow onions because of the ravages of the disease "die back," but he thought that by a careful selection of the seedlings successful crops could be raised in favored localities. Potatoes he had found yielded very satisfactory returns when sown on land that had carried peas, beans, cabbages, or cauliflowers the previous season.

The Branch decided to place on record the valuable work that had been performed in the interests of the Cherry Gardens Branch of the Agricultural Bureau by the late Mr. Thos. Jacobs.

HARTLEY (Average annual rainfall, 15in. to 16in.).

September 21st.—Present: 17 members.

The sixteenth annual Homestead Meeting in connection with the Hartley Branch of the Agricultural Bureau was held at the residence of Mr. J. M. Hudd, Bletchley, on September 21st, 1923. During the afternoon a demonstration of the Fiat 20-30 h.p. tractor pulling an eight-furrow plough, pulling logs and trees, and driving a circular saw and a milking machine, was given. Keen interest was also displayed in a milking machine that had recently been installed. In the evening 84 guests sat down to a dinner which was provided by the host and hostess (Mr. and Mrs. J. M. Hudd), over which Mr. D. F. Westwood presided. The following toasts were honored:—"The King," by the chairman, Mr. D. F. Westwood; "The State," by Mr. P. Heggaton, M.P., responded to by Mr. H. S. Hudd, M.P.; "The Agricultural Bureau," by Hon. G. R. Laffer, M.P., responded to by Mr. J. Sanderson; "The Visitors," by Mr. B. Wundersitz, responded to by Mr. F. E. Smith; "Adelaide Motors Limited," by Mr. D. F. Westwood, responded to by Mr. S. Crawford; "A. W. Sandford & Co.," by Mr. C. Hassam, responded to by Mr. S. Hattam; "Mrs. W. Brook, sen.," by Mr. J. Stanton; "The Host and Hostess," by Mr. E. J. F. Crawford, responded to by Mr. J. M. Hudd. The annual report was read by the Hon. Secretary (Mr. W. B. Hudd), and a short address, "The Tractor," was given by Mr. Edgerley. As a mark of appreciation of the interest displayed by the members of the family in the tractor trial, Miss Hudd was presented with a silver double entree dish. Games, &c., brought an interesting and enjoyable day to a close.

LONGWOOD (Average annual rainfall, 37in. to 38in.).

September 22nd.—Present: five members and six visitors.

HOMESTEAD MEETING.—The monthly meeting of the Branch was held at Mr. Gurr's residence when a very instructive afternoon was spent in inspecting the poultry plant and mixed farming practices of the Messrs. Gurr Brothers.

Mr. "Motor Transport," was read by Mr. J. C. Blakely, in which the speaker traced the period when the motor vehicle was considered an expensive luxury. At that stage Mr. Blakely traced the history of the motor car, until the day, when the motor car and the motor truck could almost be termed one of the prime necessities of the business and producing communities. An interesting discussion followed.

MacGILLIVRAY (Average annual rainfall, 19in. to 20in.).

September 25th.—Present: 10 members and visitors.

CLUB OF FARM HORSES.—The monthly meeting of the Branch was held at Mr. H. Brumby's residence, when Mr. W. Adams read a paper dealing with the care of farm horses. If horses were to receive proper attention, he said, there was only one person who should be held responsible for them, and that was the driver of the team. He should know the horses and be able to care, feed, and work them in the best manner possible. One of the first cares of the driver should be to see that the horses were properly fed and watered. The feed should be clean and of the best quality. For feeding horses, he thought the wooden manger the best because it was easily kept clean and dry. The horses could be turned out in the spring when feed was good, and they soon put on condition, and if given two or three feeds a day they would be able to stand a fair amount of work. Hay should not be chaffed too finely, so that the horses would have to chew it thoroughly whilst feeding. Plenty of good clean water close to the feeding-yard or stable should always be available. The water trough should not be in the stable yard because there always was the danger of it becoming polluted with dirt and rubbish. The stable yard should be cleaned out as often as possible. The provision of a clean rolling-yard would prove beneficial to the horses. The

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team should be carefully groomed, special care being taken with the shoulders to remove all dirt and sweat. The collars should also be cleaned at regular intervals. The harness should fit each horse properly, and one set of harness should be set aside for each horse. The mane should always be removed, and under the collar. The following points, the speaker thought, were worthy of the consideration of every teamster:—“Do not work the horses too hard, and do not overtax their strength. See that the team works evenly and that each horse does its share of the work. Do not put a small horse alongside of a larger animal and expect it to do the same work; give the advantage to the smaller horse. It is a mistake to make the horses walk too quickly, because once a horse becomes leg weary, and especially a heavy horse, it takes a long time to recover its power. The driver should occasionally walk alongside of the team because he will then have a good idea of the pace the horses are travelling. Use the whip as little as possible. Do not work a team more than eight or nine hours a day, excepting perhaps during harvest time. When the team has finished working for a few days, do not turn the horses straight out into the paddock to look for their own food; give them at least one feed a day. Trim the tails of the horses, but do not bob them too closely, and keep the mane free from knots.”

RAPID BAY.

October 13th.—Present: 26 members.

FARM BUILDINGS.—Mr. M. Jones contributed a paper on this subject. He said, one of the many items to be considered was the economical construction of sheds. Stone and galvanized iron sheds were undoubtedly the best to erect for durability and satisfactory service. The question of the best, cheapest, and most reliable roofing had also to be considered. The galvanized iron roof appeal to everyone as being the most serviceable. On the other hand, it was expensive, although it was sometimes forgotten that the first cost was the last cost. A good job was often spoilt by erecting a straw or other cheap roof, which resulted in a leaky and ugly-looking structure. It was also a harbor for sparrows and other birds and needed a great deal of attention. The gable roof was the most costly, but had many advantages over the flat roof, one important factor being that in summer it was much cooler; it also had a much better appearance, and was not so likely to be blown off during strong gales. On the other hand a flat roof covered a greater amount of floor space, and timber was also saved, which was a large item in the construction of any building. In the southern districts it was advisable to have the open side of the building facing the south-east or east, because the greater portion of the rough weather came from the west and north-west. A good discussion followed the reading of the paper.

ROCKWOOD.

September 24th.—Present: 15 members.

DAIRYING.—The following paper was read by Mr. L. Tucker:—“The success of a dairy venture largely depends on whether the dairyman has a farm suitable for his occupation, because it is not all farms that are suitable for this purpose. The dry period of the year calls for artificial feeding, and I find that the herd demands the heaviest amount of feeding during April, May, June, and July. The longer the farm supports the herd without aid, the larger will be the profits. By support, I mean haystacks, bran, and oats, the purchase of which during the cold weather considerably reduces the profits. Nevertheless, there are many kinds of cereals that can be brought into use at this juncture. Dairy farmers frequently refer to the use of maize, mangolds, clovers, and lucerne. Of the above fodders, I have found lucerne to be the best. The care of the herd is another important part of the dairy business, because it is not every man that is suitable to manage a dairy herd. During milking the cow should be kept as calm and as normal as possible. The time of milking is very important. I get up at 6 o’clock in the morning during both summer and winter is something which does not appeal to many people, and the man that is loath to leave his blankets in the morning will not be able to give the proper care to his stock, firmly believe in punctuality for working a dairy. Milking cows at 6 o’clock in the morning, 7 the next morning, 5 at night, 6 another night, will not permit of the work being done to the best advantage. If the milking is done at, say, 6 a.m.,

comes to come home at these hours. The actual milking of the cows is another important point which many dairy men do not seriously consider, and especially fail to note that milking machines are in use. I strongly recommend stripping the cows, either machine or hand milking is practised. When a cow comes in it is a mistake to milk her out quite dry. It is always advisable to leave some milk in the udder for five or six days, until inflammation and the danger of her catching cold in the udder is reduced. As a preventive, I suggest that a small quantity of kerosene and olive oil should be rubbed into the udder for the first day or two. If a cow has a "weak quarter," it is a very good plan to milk that quarter out for a fortnight before she comes in. Where a dairyman only has a small herd and does not market his cream, say more than twice a week, he should always run the cream from the morning and night milking into separate vessels, and mix the cream together when it is cold. When, however, the cream is sent away every day, I find that it is best to run the day's cream into one vessel, but the cream must be stirred at every opportunity in order to prevent it separating too quickly. Always wash and scald all the utensils immediately after use." In the discussion that followed Mr. S. Collett said punctuality in the times of milking, both morning and evening, were essential. Mr. Currie stated that he had three acres of red clover on which 20 cows were kept continuously through the summer months. He had found the practice of milking out the weak quarter of a cow before calving a very good practice. Mr. E. R. Heath found mangolds a good fodder for cows. Mr. Dunn said punctuality was the key to success in dairying. It did not matter if the cows were milked at 4.30 a.m. and 2.30 p.m., if those hours were kept each day. He believed in feeding artificially, and considered a good cow would always pay for its feed. A cow would always respond to proper care and kindness. The Hon. Secretary (Mr. M. J. Meyer) was a strong believer in keeping regular hours for milking periods, and also in stripping out after milking. He was at the present time conducting a thorough test in feeding costs. The weight of crushed oats, bran and chaff was measured, the cost arrived at, and when those costs were placed against the cream returns it was found that in spite of the high price of foodstuffs a very substantial profit was gained, with butter at 1s. 5*½*d. per lb.

ASHBOURNE, September 24th.—Mr. H. R. Meyer read a paper, "Sheep Farming," and supplemented his remarks with extracts from the paper read at Congress by Mr. R. C. Scott, "Fat Lamb Raising Experiments."

ASHBOURNE, October 23rd.—The Hon. Secretary (Mr. V. H. Cox) read a paper, "Beekeeping," and also a number of extracts taken from the *Bee Journal*. An interesting discussion followed.

BLACKWOOD, October 15th.—The Assistant Dairy Expert (Mr. H. J. Apps) attended the meeting and delivered an address in which he dealt with several phases of the dairying industry.

BLOCK E, September 10th.—Mr. S. T. Woodward attended a special meeting of the Branch and outlined his scheme for the reorganisation of the A.D.F.A., which was followed by a good discussion.

At a meeting of the Branch held on September 25th Mr. C. A. Ritchie contributed a paper entitled "How to Read the Barometer," and a long discussion ensued.

KANGARILLA, October 25th.—Seventeen members and 15 visitors attended the October meeting, when the Horticultural Instructor (Mr. Geo. Quinn) delivered an address, "Pests in the Orchard."

LONGWOOD October 20th.—The monthly meeting of the Branch was held at Mr. J. Roebuck's homestead. Accompanied by the host and his family, members spent a most enjoyable afternoon in inspecting the orchard and vegetable garden. Afternoon tea was provided by Mrs. Roebuck.

MOUNT BARKER, October 24th.—Addresses dealing with the subject, "Tools of Pig Required by the Bacon Curing Trade," were given by Messrs. G. J. H. and H. A. Monks to an attendance of 30 members and several visitors.

MOUNT PLEASANT, October 12th.—Mr. J. S. Miller read a paper, "The Congress and the Show," in which he gave a comprehensive report of both gatherings. A keen discussion followed.

PORT ELLIOT, October 17th.—Mr. Wm. Green reported on the proceedings of the Annual Congress. The subjects, "Spraying Fruit Trees," "Sheep Dipping," and "Rabbit Destruction," were brought before the meeting, and a keen discussion followed.

SHOAL BAY, September 23rd.—Nine members and three visitors attended the September meeting when a paper, "How to Make the Best of Your Land," was read by Mr. A. Nash. The report of the delegates who attended the Annual Congress was also received and discussed.

SHOAL BAY, October 23rd.—Mr. O. B. Schafer read a paper, "Preparing Scrub Land for Agriculture." The writer recommended ploughing with the stump-jump plough in preference to the disc implement, and suggested a sowing of 1½ bush. of Algerian oats with 100 lbs. super in order to secure a good stubble-burn. Members generally favored the disc plough because it was not so likely to hang on the stumps as the stump-jump plough.

SOUTH-EAST DISTRICT.

ALLANDALE EAST.

October 26th.—Present: 11 members and three visitors.

DAIRYING.—A lengthy paper under the heading "How to Make the Best of Your Land," was read by Mr. Davidson. The South-East from Penola to Allandale, and Glenburnie to Furner, had unlimited possibilities in the production of milk, pork, and mutton. The rainfall was sure, the climate congenial, the soil excellent—an ideal region for dairying. "Take a farm of, say, 60 acres of second quality land," he continued. "A man should be able to milk 20 cows, which, if fed fully, would return £350 a year; besides, he could make £30 on pigs, £20 in calf stock, making a total of £490. In addition, he would partly keep his house and live rent free. Many are doing better than this on smaller holdings by intense culture and well-regulated herds, with the farm wisely divided into suitable paddocks say, 40 acres for grazing and 20 acres devoted to hay and fodders, varieties to suit each season of the year. Ten acres for hay would leave 10 acres for plots of millet, Sudan grass, lucerne, maize, chou moellier, and the usual catch crops in autumn of barley, oats, vetches, and peas. A man and his wife, or a lad, can manage a herd of 20 cows, while with the aid of a milking machine one person can attend to all the milking, as the whole herd of 20 would never be all in milk at the same time. At least one-third of the herd should calve at the end of summer or early autumn. As soon as the natural grass dries off at the end of December the green fodders come into use. Either lucerne, millet, or Sudan grass will be ready to graze, and chou moellier can be hand-fed. With any crop that the cows can graze much labor is saved. Cows should not be allowed to graze such crops more than two to three hours a day. For the other part a liberal allowance of hay or chaff should be fed. This, with the green fodders makes a balanced ration. While I do not advocate excessive hand-feeding, yet at seasons it pays really well. Concentrates, such as crushed oats, bran, and linseed meal, fed in the colder months in conjunction with green food, add considerably to the cow's welfare, and keep up her condition and flow of milk. About 10 lbs. of chaff a day and a few pounds of oats, linseed meal, or ground barley make an ideal ration. The superabundance of grass and rank growth of oats and barley, which often are half-wasted in the growing months, should be conserved either in a stack, pit, or above-ground silo. Splendid ensilage can be made by stacking the green stuff if a proper silo cannot be afforded. The

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¹² AGRICULTURAL BUREAU.—Particulars of this Organization, of which every farmer should be a member, can be had on application to the Department.

cows eat it readily when the grass dries off, and respond at the bucket as if they had been turned into a paddock knee-deep in clover and grasses. Without proper and continuous feeding the herd will only produce one-half its full capacity. At least half the cows in the State, and for the matter of that, in the South-East, are half-starved for half the year. When a herd of cows, be they ever so few, is allowed to spell and loaf, and dry off for the lack of food after mismanagement for five or six months in the year, the owner is simply courtting disaster. He is ruining any milking abilities his cows may have. A normal cow should at least do duty for 10 months of the year. Every farmer should endeavor to arrange for a continuous flow of milk, by wisely mating the animals at the right period, so that the cow will have every opportunity of giving a payable quantity of milk in the year. It is an unprofitable and shortsighted policy to lose the use and value of a cow for many months in the year. Not only that, the milking habit is curtailed—the milk organs become in a way atrophied, because the mammary glands are not given a chance to develop. A cow habitually allowed to dry off after six months' lactation goes dry, or partially so, at the same time each year in sympathy with habit. That is why the period of milking in a heifer should be extended as long as possible to make her acquire the habit. All dairy farmers imbued with a desire to increase their incomes in the wisest way must study the individuality and needs of their cows as a first essential. A large number of cows have latent milking abilities that never get a chance to develop at the bucket, simply because they are for half the year undernourished, underfed, and often at starvation point when natural grasses dry off. It is a well-known fact that there are numerous cows in the South-East, and elsewhere, too, that produce only 250 gallons in their lactation period; but if the same animals were fed discriminately and continually to their full digestive capacity, many of them would reveal qualities and produce quantities that would surprise their owners."

KONGORONG.

October 22nd.—Present: 20 members.

RAISING AND FEEDING PIGS AS A SIDE LINE.—The following paper was read by Mr. W. G. Morrison, who had had experience in the raising of pigs in Canada:—"In spite of the reputation the pigs have for uncleanness, they are really very clean animals, provided they have the opportunity, and there is almost no limit in the variety of food they will consume, but they always prefer wholesome feed to more or less doubtful refuse. Clean, warm, healthy housing and wholesome food are essential for the best results. In the first place, there is no animal on the farm that will respond more quickly to good treatment and accommodation, and few will give quicker returns. With proper care and food a pig should weigh 200lb. live weight at six months old. I favor a Yorkshire or Tamworth sow. They both make first class mothers, and usually raise from 10 to 14 in each litter twice a year. This class of sow mated with a good Berkshire or Chester white boar will produce first rate pigs of the bacon type. They mature early and are easily fattened, and furnish the class of carcass the American packing houses demand for their export trade in bacon and hams. If the American packing houses demand this class of pig, the same must hold good in Australia, because the market of both countries is Europe; and, as is well known, both Canada and the United States of America have a very large export trade in cured meats. So far as I can find out, Australia seems to have neglected this line of export and concentrated on frozen mutton. To make a place for herself in the world's markets, Australia must produce what these markets demand, and not what we may want them to take from us. She must squeeze the other fellow out, and to do this we must produce at least as good or better articles. The young pigs should have an outlet from the brood pen to separate trough, in which they can be fed with pollard and either skim milk or whey and also have the run of a plot of good green fodder, such as kale, radish or oats a few inches high, as soon as they will eat for themselves. At eight weeks the litter can be weaned and brought along on chiefly green fodder, with a small allowance of pollard and whey. When about four months old a little dry crushed oats may be added to the feed. At five months they should be well developed, and will require comparatively little extra feeding to finish for

market. The pigs that are to be fattened should then be placed in a fattening pen, where exercise will be more or less restricted. This pen should be the sleeping quarters, and it must be absolutely wind and weather proof, but well ventilated with a floor so that the bedding will be kept thoroughly dry. I prefer crushed barley for the fattening ration. Barley-fed pork is considered superior in flavor and texture to corn-fed. I always feed the barley dry. At all stages of the pigs' development they should have access to clean fresh water. It is comparatively easy to grow kale or rape for nine months of the year in this district, and with two or three small paddocks of these fodders the pigs can be changed from one to the other, especially if a movable shelter is provided that will shelter them from the hot sun or strong winds. Barley can be grown very easily, and will produce good yields on land that has grown a crop or two of wheat or oats. So far as I can find out, 20 bush. of barley is by no means an uncommon yield in the South-East, and 10 acres would yield, at that rate, 200 bush., which would finish a large number of pigs, and give a very profitable return per acre as well. On one occasion I kept an accurate account of the gain in weight and the amount of barley consumed in the fattening of eight hogs. When I sold the pigs, barley in Canada was worth 1s. 5½d. a bushel, and I sold the barley in the form of pork at 2s. a bushel. These figures are by no means extraordinary, but show that in many instances the grain can be made to pay better returns if fed to stock. As the local cheese factory is proposing to install a grain-crusher, the opportunity to feed crushed grains will be within the reach of all. Many people hold the opinion that if pig-raising were carried on more extensively here and throughout Australia, prices would drop below any chance of a profit. That is perhaps true in a sense, but, according to the press, there seems to be a decided movement towards developing a market abroad for Australian hams and bacons. So far, it has not been too successful, chiefly because we do not have the quantity to supply a fair demand when that demand is created, and also partly because Australian packers do not seem to put up quite the class of goods demanded abroad. The packing houses in Australia seem to cater to the local demand only and never give a thought to the foreign markets, and as a consequence are very independent in regard to the price they pay for the pigs and also the class of bacon they turn out. The American packers reached the position which they hold to-day by studying the class of goods demanded in Europe, and they have succeeded in competing successfully with Denmark, probably the largest bacon and ham exporter, per capita, in the world. To export cured meats in sufficient quantities to supply the demand, when that demand is established, requires large up-to-date establishments, involving the outlay of a considerable sum of money, yet I firmly believe that the day is not far distant when the small curing plants scattered all over the State will be done away with, and these will be concentrated in a few large up-to-date establishments in some of the largest seaports and cities. The fact that the pigs have to be travelled perhaps 600 or 700 miles to the ship is not an insurmountable difficulty, because a well-finished pig fed on dry barley chop will shrink very little in weight on such a journey, provided the animals are fed and watered after so many hours on the train. This is compulsory in the North American Continent. The American stock trains are not allowed to be shunted on to a side track and left standing beyond a certain time limit. There seems to be a prevalent idea that pigs cannot be shipped any considerable distance in Australia in warm weather, on account of the abnormal shrinkage in weight. Such trouble, I consider, lies chiefly in the method of handling and the accommodation provided for the stock during transit. Pigs are shipped every month of the year in Canada, and I have shipped fat pigs 700 miles in July—the warmest month in Canada—with very satisfactory results. If livestock were handled by the railways somewhat along the lines in force on the American Continent, it would be found that the shrinkage would practically adjust itself when Australia becomes a bacon and ham exporter, because the packing houses will demand that the animals shall arrive at the abattoirs in first class condition. I have more than once heard it mentioned that pigs, as a whole, are not so healthy in the South-East as they are in some other districts. Personally, I believe that 99 per cent. of the trouble lies in the unhealthy and neglected conditions of the pig yards, as well as the custom of throwing them almost any and every kind of refuse to be eaten; and if in the morning and 4.30 in the afternoon, it is surprising how the herd will

the pigs are not fairly well fed, and happen to be fed only enough to keep them alive, they will certainly eat almost anything, with the result of unhealthy and thrifless animals." Figures were then quoted by the speaker from the Department of Agriculture Bulletin 164, "The Pig Industry, a Neglected Source of National Wealth."

MILICENT (Average annual rainfall, 29.25in.).

October 6th.—Present: 12 members.

SPRING FALLOWING.—Mr. F. Kay read the following paper:—"By spring fallowing I mean the practice of breaking up land in the spring, with the ultimate object of a grain crop to be sown in the following autumn. It must be admitted that this practice is lacking in our district, but it is very popular in other parts of the State. Bare spring fallow consists of ploughing the land fairly deeply as soon as the winter has settled sufficiently to enable the work to be done without clodding the soil, and to cultivate the soil during the summer according to the rains. To arrive at the monetary value of this practice, it will be necessary to experiment with two fields of similar soil, and keep an account of the results. The spring fallow field will have to be debited with the loss of grazing and whatever summer cultivation it may have received, then at harvest time it can be definitely said whether spring fallowing is a profitable undertaking. Much has been said of the loss of feed from land that is kept under bare fallow, but on the basis of a sheep-to-the-acre yielding £1 per acre net profit from each sheep, it would only need 4 to 5 bushels extra of wheat at harvest time to compensate for the loss of grass. In the case of a straight-out business of grain production, where half the farm each year is under crop and half under bare fallow during the summer months, the sheep-raising capacity is limited to the period of the stubbles—from after harvest until the stubble is ploughed in at fallowing time, say, in September. If three-course rotation, crop, fallow, and stubble is adopted, as is now commonly practised in the northern wheat areas, it will be found that the extra feed produced on the stubble, together with the green picking that will be had from the fallow, especially after summer rains, will enable an increase to be made to the number of sheep that can be carried on the property. In the north the practice of burning the stubbles is not carried out to any great extent, and it is a fact that there are more sheep reared now in the northern wheat areas than there were on the land in the days of the squatters. Northern practices are not always applicable to these parts, but we may learn much from our neighbor's experience, and I venture to say that much good would be derived from further experiments in these districts in the matter of spring fallowing." In the discussion that followed Mr. F. Williams said he thought that fallowing would not pay on the expensive land in the Millicent district. Mr. D. Hannaford said the stubble feed and green picking on the fallow would be equal to all grazing, in addition to the enhanced grain yield, that would be obtained. Fungus diseases and foreign weeds were never so noticeable on ground that had been spring fallowed. Mr. G. Major had left a strip of unploughed land in a fallowed paddock that had been sown with Yandilla King, and that strip was noticeably behind the other portion of the paddock. Mr. F. E. White said feed grew better on burnt stubble than on land that was not burnt. Messrs. F. T. Clifford, J. W. Williams, and H. J. Hutchesson agreed with the last speaker.

NARACOORTE (Average annual rainfall, 22.60in.).

September 8th.—Present: nine members.

POULTRY BREEDING AND FEEDING.—The following paper was read by Mr. F. A. Holmes:—"This is one of the most important subjects that can claim the attention of the poultry breeder, and is one which underlies all the principles of successful poultry breeding. The birds in the breeding pens should have all the characteristics of productiveness, and the most essential factors are type, constitution, vigor, and general character. Do not mate up every bird you have; select the best layers of last year, and see that they are good types of their breed. The heavy layer should have a deep, wedge-shaped body with plenty of room inside, and the pelvis bones should be fine and flexible. The head is the

test guide to the quality of a bird of either sex, but particularly the male. The flesh should be bright and bold, the head rather long, the neck slim and graceful. The short-necked, heavy-headed bird is generally a poor one. The legs should not be too long, but set wide apart. Beware of the knock-kneed lanky specimen. These remarks, while brief, may serve as a warning and be helpful to beginners, because after all it is easy to make or mar success by the right or wrong mating. You will now presume that the stock has been mated correctly from which it is expected to raise the young flock. Hatching the eggs is the next step. The incubator is the best method, for the stock is bred at the right time, which means that if you feed correctly you have the egg profits coming in at the period when the maximum prices are obtainable. The first point is to fill the machine with good hatchable eggs. By this I mean eggs of good shape, smooth shell, and free from wrinkles. Discard all those which are mottled or are rough-shelled, because they seldom hatch. In about seven days examine them each separately before a lamp in a dark room (or at night) and you will then see which are infertile. Take all clear eggs out (these can be used in the kitchen); the remainder will remain in the incubator for another 14 days; during that time they should be aired and turned over twice daily. When 20 days have elapsed, you should be able to see the eggs chipping, and within the next two days all which are coming out will be ready to remove to the brooder. Do not feed the chicks for at least 48 hours after they are hatched. They are sufficiently provided for by nature when they left the egg to last over at least twice this period. Their main requirements are rest and warmth. Having passed the first day or two on the sand in the brooder, they can now be given water in shallow tins, or, better still, a jamtin, punch a small hole about three-quarters of an inch from the top, fill it with water, and invert it in saucer. Sufficient water will come out, and rest in the saucer, and the tin will prevent the chicks getting into it. The first meal should be of coarse oatmeal or flaked oats. This can be continued for a few days. I feed a good deal of bran to my chicks by putting it in flat tins and having it always before them. Give green feed to them early. It must be chopped finely. Also keep shell grit in front of them, and do not forget to let them have plenty of fresh air. After about the second week they can be given cracked grain and soft food. The latter stretches the crop and is easily and quickly digested. Green feed is one of the most important items of the chick's menu, and it should be freely given—as much as they will eat. At five or six weeks they can be put on adult feeding. Meat meal is also a splendid food to bring them along if fed in moderate quantities. They need feed that will keep the birds healthy and robust. It is entirely in the hands of the poultry-keeper whether pullets lay in five months or wait until they are 10 months before making a start. The profitable fowl is the early-laying fowl, and early laying is a habit developed by breeding from early layers, by hatching the chickens at a time that will bring them to the laying stage in the early winter. Mongrel-bred flocks are perpetuated by breeding from layers of all ages at all times of the year, and from the hen which lays only 30 or 40 eggs a year as well as the more prolific members of the flock. Clear out the mongrel stock, forget the old methods, and start with good stock, and then you will realise to the full the profit-producing power of the hen. Poultry will pay handsome dividends on cost if given a reasonable chance. Give the poultry a chance to show what they can do by having good stock properly housed, fed, and cared for. Provide comforts for the birds and they will provide profits for you. If all do their utmost to raise more poultry, better poultry, and profitable poultry, it will be helping the world at large, profitable to yourselves, and a help to building up an important industry."

RENDELSHAM,

September 26th.—Present: 13 members.

VEGETABLE GROWING.—The following paper was read by C. H. Faerlie.
Good methods of cultivation and early sowings are essential for the success of the vegetable garden, especially in dry districts. Without proper

cultivation the moisture supplies in the soil are quickly dissipated into the air, while early sowing is necessary to enable the crops to make a maximum amount of growth while conditions are suitable for their development. The garden should be well stocked with beans, peas, cabbages, cauliflowers, onions, turnips, and salad plants of various kinds. Liberal sowings of carrots and parsnips should be made at this time of the year, because these roots form a valuable standby. Under favorable conditions the root crops will attain useful size within three months, but in deep soil, where a moderate amount of moisture can be maintained, they will continue to grow throughout the summer months, and will continue to do so through the autumn and winter. The ground between the rows of all growing crops should be kept in a loose, open condition by surface cultivation. This is particularly important after rain has fallen in sufficient quantity to establish capillarity between the surface soil mulch and the moist layer below. When the crops have made sufficient headway, a liberal mulching of stable-manure will further help to conserve moisture. The mulching does not do away with surface cultivation, and after a heavy rainfall the manure should either be moved aside to enable the soil to be loosened with the hoe or cultivator, or the digging-fork may be used to loosen the soil without moving the mulch. In small gardens it is generally necessary to stock the ground rather heavily in order to accommodate the variety of vegetables it is desired to grow. In such cases artificial waterings will be necessary during the dry weather to ensure a payable return from the area under cultivation. In gardens where ample space is provided it will pay to give plenty of room between the rows as well as between the individual plants. In farm gardens the cultivation may be carried out by means of horse-drawn implements, and hand work, even in weeding, may be greatly lessened. The principal advantage obtained from allowing wider spaces is that more moisture will be available for the growing vegetables. When moisture is conserved and the plants given more room, soil moisture is turned to the most profitable account. So long as there is sufficient moisture in the ground the moisture will move towards the point where it is being used. When evaporation is checked the only way of its escape will be through the plant itself, and it will be used for the growth of the plant. In districts where artificial watering cannot be practised, every effort should be made to get the summer vegetables as forward as possible while there is still sufficient moisture in the soil. Fresh horse manure is plentiful on farms and also in most districts, and by using the heat produced by its fermentation, young plants, such as tomatoes, melons, marrows, cucumbers, and other tender plants may be forced along, so that when finally planted out they have almost reached the fruiting stage. In the mean time the ground to be used for these plants should be well prepared by digging and manuring, and afterwards kept in a state of good fallow until the plants are put out. A considerable saving of time can also be effected by germinating French beans in moderate heat, and transplanting the seedlings in permanent positions during this month. The Canadian Wonder is a splendid dwarf bean and being a heavy cropper, rapidly comes into bearing. Seeds with a hard coating may be put into hot water and allowed to stand for 12 hours; when those that have swollen can be removed and planted. The Scarlet Runner bean is a good variety for late autumn use. It does not set well in summer, but if planted in well-worked soil it will survive the summer and yield an abundance of pods, aided of course, by autumn rains. French beans of any description may be cut and dried in the sun. These, when soaked and cooked, provide a good dish during the winter months when the green bean is unobtainable."

KALANGADOO (WOMEN'S). October 13th.—A paper, "Home Nursing," that had been forwarded by the President of the Saddleworth Women's Branch of the Agricultural Bureau was read and discussed, and the report of the delegates to the Annual Congress was received.

TATTARA, October 20th.—Mr. A. E. Milne read the paper, "Farm Management and Efficiency," that had been presented at the Annual Congress, and a keen discussion followed.

